

HD-A138 295

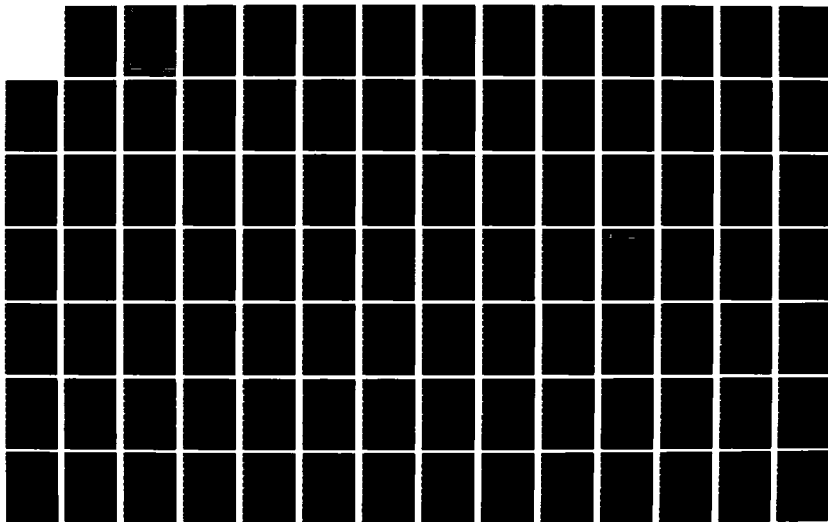
FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT LAKE  
DARLING FLOOD CONT. (U) CORPS OF ENGINEERS ST PAUL MN  
ST PAUL DISTRICT NOV 83

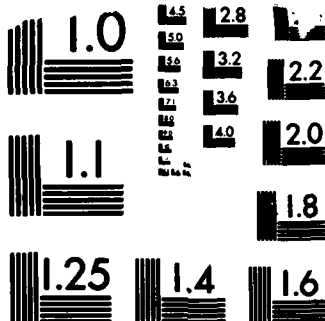
1/3

UNCLASSIFIED

F/G 13/2

NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A



US Army Corps  
of Engineers  
St. Paul District

3

AD A138295

# FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

## LAKE DARLING FLOOD CONTROL PROJECT

SOURIS RIVER, NORTH DAKOTA

AND

## FINAL FEATURE ENVIRONMENTAL IMPACT STATEMENT VELVA FLOOD CONTROL

VELVA, NORTH DAKOTA

DTIC  
ELECTED  
FEB 27 1984

DTIC FILE COPY

NOVEMBER 1983

84 02 24 012

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

| REPORT DOCUMENTATION PAGE  |  | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                    |
|--|--|--|
| 1. REPORT NUMBER   | 2. GOVT ACCESSION NO.<br><b>AD-A138295</b> | 3. RECIPIENT'S CATALOG NUMBER                                  |
| 4. TITLE (and Subtitle) FINAL PROGRAMMATIC ENVIRONMENTAL<br>IMPACT STATEMENT: LAKE DARLING FLOOD CONTROL PROJ<br>ECT, SOURIS RIVER, NORTH DAKOTA AND FINAL FEATURE<br>ENVIRONMENTAL IMPACT STATEMENT VELVA FLOOD CONTROL,<br>VELVA, NORTH DAKOTA.  |  | 5. TYPE OF REPORT & PERIOD COVERED                             |
| 7. AUTHOR(s)   |  | 6. PERFORMING ORG. REPORT NUMBER                               |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>U.S. Army Engineer District, St. Paul<br>1135 USPO & Custom House<br>St. Paul, MN 55101   |  | 8. CONTRACT OR GRANT NUMBER(s)                                 |
| 11. CONTROLLING OFFICE NAME AND ADDRESS  |  | 10. PROGRAM ELEMENT, PROJECT, TASK<br>AREA & WORK UNIT NUMBERS |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)  |  | 12. REPORT DATE<br>November 1983                               |
|  |  | 13. NUMBER OF PAGES<br>120 p.                                  |
|  |  | 15. SECURITY CLASS. (of this report)                           |
|  |  | 15a. DECLASSIFICATION/DOWNGRADING<br>SCHEDULE                  |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>Approved for public release; distribution unlimited.  |  |  |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)   |  |  |
| 18. SUPPLEMENTARY NOTES  |  |  |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br><br>FLOOD CONTROL<br>ENVIRONMENTAL IMPACT STATEMENTS<br>NORTH DAKOTA<br>SOURIS RIVER   |  |  |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>This report contains two environmental impact documents: a programmatic<br>environmental impact statement (EIS), which covers the general impacts and<br>concerns of the Lake Darling project; and a feature (or site-specific) EIS<br>covering the specific impacts and concerns of the flood control project at<br>Velva, North Dakota. |  |  |



## PREFACE

This volume contains two environmental documents: a programmatic environmental impact statement (EIS) and a feature (or site-specific) EIS. The programmatic EIS covers the general impacts and concerns associated with the entire Lake Darling project, while the feature EIS covers the specific impacts and concerns associated with project features at Velva, North Dakota. A third EIS covering the site-specific impacts of project features at Lake Darling and some downstream areas will be prepared in 1983. After this third document is released as a final EIS to the public for at least a 30-day review and after the record of decision is signed, the environmental evaluation of the Lake Darling project will be complete.



A-1

A

FINAL  
PROGRAMMATIC  
ENVIRONMENTAL IMPACT STATEMENT  
LAKE DARLING FLOOD CONTROL PROJECT  
SOURIS RIVER,  
RENVILLE, WARD, MCHENRY, AND  
BOTTINEAU COUNTIES, NORTH DAKOTA

Department of the Army  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

November 1983

FINAL  
PROGRAMMATIC  
ENVIRONMENTAL IMPACT STATEMENT  
LAKE DARLING FLOOD CONTROL PROJECT  
SOURIS RIVER,  
RENVILLE, WARD, MCHENRY, AND  
BOTTINEAU COUNTIES, NORTH DAKOTA

The responsible lead agency is the U.S. Army Engineer District, St. Paul, Minnesota. The responsible cooperating agencies are the U.S. Fish and Wildlife Service and the U.S. Environmental Protection Agency.

Abstract: The proposed Lake Darling flood control project (authorized by the 1982 Energy and Water Development Act) consists of an approximately 4-foot raise of Lake Darling plus associated upstream and downstream flood control measures, including those at Velva, North Dakota. This programmatic EIS covers all project features. In addition, a site-specific EIS for the Velva portion of the project follows this programmatic EIS. A site-specific EIS for the Lake Darling features will be released later.

The St. Paul District has been investigating flood control alternatives for the Souris River since 1963. A channel modification project in Minot was authorized in 1970, and construction is now complete. Construction of a large dam (Burlington Dam) on the Souris River was authorized in 1970 to provide additional flood protection for Souris Valley residents. A draft EIS for the Burlington Dam project was completed in October 1977, and a draft supplement was completed in January 1980. Neither the EIS nor the supplement was filed with EPA as a final document. The 1982 legislation prohibits the Corps from further work to implement the Burlington Dam project unless directed to do so by Congress.

Most of the flood control features currently under evaluation for the Lake Darling project were also features of the Burlington Dam project. The dam itself and the Des Lacs tunnel diversion structure are not part of the proposed project.

The proposed 4-foot raise of the Lake Darling flood pool will increase the level of protection at Minot from a 16-year to approximately a 25-year combined Souris and Des Lacs Rivers flood or to a 35-year flood originating on the Souris River alone. The various downstream flood control features would prevent damages from the proposed 5,000 cubic feet per second releases from Lake Darling. The Velva portion of the project would protect Velva from a 100-year flood (flows of 14,700 cubic feet per second) after the Lake Darling Dam is raised, but would protect Velva against only a 70-year flood before the raise.

If you want further information on this EIS, please contact:

Mr. Robbin Blackman  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101  
FTS Telephone: 725-7746  
Commercial Telephone: (612) 725-7746

Send your comments to the District Engineer within 30 days of the notice in the Federal Register.

## TABLE OF CONTENTS

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| 1.00 SUMMARY  | 1           |
| Major Conclusions and Findings  | 1           |
| Areas of Controversy  | 1           |
| Unresolved Issues   | 2           |
| Relationship to Environmental Protection Statutes<br>and Other Environmental Requirements | 3           |
| Content and Scope of the EIS  | 3           |
| 2.00 NEED FOR AND OBJECTIVES OF ACTION  | 4           |
| Study Authority   | 4           |
| Public Concerns   | 4           |
| Planning Objectives   | 5           |
| 3.00 ALTERNATIVES   | 5           |
| No Action   | 5           |
| General   | 6           |
| Downstream Measures for Reservoir Operation   | 7           |
| Refuge Structures   | 8           |
| Future Studies  | 9           |
| 4.00 AFFECTED ENVIRONMENT   | 9           |
| Environmental Conditions  | 9           |
| Significant Resources   | 11          |
| Cultural Resources  | 13          |
| Recreation Resources  | 14          |
| Aesthetic Values  | 15          |
| Social Resources  | 15          |
| 5.00 ENVIRONMENTAL EFFECTS  | 17          |
| Significant Impacts   | 17          |
| Cultural Resources  | 21          |
| Recreation Resources  | 21          |
| Aesthetic Values  | 22          |
| Social Resources  | 23          |
| Other Impacts   | 25          |
| 6.00 PUBLIC INVOLVEMENT   | 26          |
| Required Coordination   | 26          |
| EIS Distribution  | 27          |
| Public Views and Responses  | 27          |

## TABLE OF CONTENTS (CONT)

| <u>Section</u>                                 | <u>Page</u> |
|--|-------------|
| 7.00 SUPPLEMENTARY ENVIRONMENTAL DOCUMENTATION | 30          |
| Fish and Wildlife Resources                    | 30          |
| Water Quality                                  | 31          |
| Prime Farmlands                                | 31          |
| Cultural Resources                             | 31          |
| Social Resources                               | 32          |
| Recreational Resources                         | 32          |
| Mitigation/Compensation                        | 32          |
| LIST OF PREPARERS                              | 33          |
| REFERENCES                                     | 34          |
| TABLES   | 35          |
| PLATES   |             |
| EXHIBITS                                       |             |

### LIST OF TABLES

| <u>No.</u>  | <u>Page</u> |
|---|-------------|
| 1 Relationship of the Proposed Plan to Environmental Requirements | 35          |
| 2 Comparative Impacts of Alternatives and Features                | 36          |

### LIST OF PLATES

| <u>No.</u>                            |
|---------------------------------------|
| 1 - General Project Plan and Location |

LIST OF EXHIBITS

No.

- 1 - Fish and Wildlife Planning Aid Letter
- 2 - Letters of Comment and Corps Responses

## 1.00 SUMMARY

### Major Conclusions and Findings

1.01 The Lake Darling flood control project was specifically authorized by the 1982 Energy and Water Development Appropriations Act (Public Law (P.L.) 97-88). Congress directed the Corps of Engineers to implement the 4-foot raise of Lake Darling and associated features. Study of flood control alternatives other than the dam raise was not authorized by this act. Therefore, the Corps of Engineers will not develop separate national economic development (NED) and environmental quality (EQ) plans for this project, although selection of the recommended features of the Lake Darling project will involve identification and development of the best combination of NED and EQ benefits.

1.02 A tiered approach for environmental impact statements (EIS), as discussed in paragraphs 1.18 and 1.19, will be used for this project. This approach will enable construction on the Velva features to proceed as the first phase of the Lake Darling project. Other project features will be formulated and reevaluated sufficiently so that impacts can be discussed in a later site-specific EIS.

### Areas of Controversy

1.03 The most significant area of controversy is fee title acquisition of private properties necessary for project features, which is opposed by both upstream and downstream residents. Local interests prefer other measures such as floodproofing, levee protection, or no action to fee title acquisition.

1.04 Another concern of many local residents is their belief that wetland drainage in the basin contributes to Souris River flood problems and that a moratorium on drainage or stricter control of drainage should be part of a total watershed management program. Residents also believe that the raise of Lake Darling would induce additional authorized and unauthorized wetland drainage in the Souris basin. At this time, there is no evidence that the potential for downstream flooding acts as a constraint on wetland drainage projects. Economic incentives and technical feasibility influence decisions to drain and develop wetlands; moral considerations of downstream effects on others seem to have only a minor influence on such decisions.

1.05 The operating plan for release of stored floodwaters from Lake Darling has been an area of controversy. Upstream residents and the Fish and Wildlife Service prefer a rapid rate of drawdown so that normal operations could resume as quickly as possible. Most downstream landowners prefer reducing release rates early enough to allow bottomlands to be planted that season.

1.06 Two potential operating plans were coordinated with local citizens, agencies, and organizations. One was the recommended operating plan that was developed and coordinated for the Burlington Dam project and that appears to be feasible for the Lake Darling project as well. This plan would release 5,000 cubic feet per second (ft<sup>3</sup>/s) until 15 May, when the discharge would be reduced to the inflow rate of 500 ft<sup>3</sup>/s to allow downstream farming during



flood years. The other operating plan considered would release 5,000 ft<sup>3</sup>/s until Lake Darling reaches the operating pool level.

1.07 At a meeting with local interests in Minot, North Dakota, on 15 January 1983, an operating plan was recommended that would release 5,000 ft<sup>3</sup>/s until the Lake Darling pool level reaches elevation 1600 feet above mean sea level (msl). On or about 15 May (or when the pool falls below 1600, whichever is later), releases will be reduced to a maximum of 2,500 ft<sup>3</sup>/s until 1 June (as long as the pool level does not exceed elevation 1600) when the remaining storage above elevation 1596 would be released, but the rate would not be less than 500 ft<sup>3</sup>/s until the conservation pool elevation is reached.

#### Unresolved Issues

1.08 Costs and Benefits - The local share of costs for the project has not been determined.

1.09 A joint water board that would be the local sponsor for the project has recently been established. Principles governing the board, such as allocation of project costs according to benefits received, are now being discussed (and will be within the framework of State laws). Many details remain to be resolved. Foremost among these are the capacity and the willingness of the board to raise the very large amount of money necessary in the event that the Army's proposed 35-percent local cost-sharing is eventually required. An additional difficulty is that a part of the overall project (the measures at Velva) may be initiated before a decision is made for the entire project.

1.10 Current estimates of costs and benefits of the Lake Darling-Souris River project use a 5-1/8-percent interest rate (consistent with the Minot channel improvement project, which is considered the first phase of the total flood control project on the Souris River), at October 1983 price levels. These estimates indicate that the first cost of the project would be \$68,132,000 (\$63,979,000 Federal cost and \$4,153,000 non-Federal cost). Average annual benefits would be \$5,459,700, and average annual costs would be \$4,183,200, for a benefit-cost ratio of 1.3 (for every dollar spent, a return of \$1.30). The project has an assumed life of 100 years for the purpose of evaluation of benefits and costs.

1.11 More than 90 percent of the total average annual benefits are attributable to flood damage reduction in urban developments. Less than 10 percent of the average annual benefits are attributable to flood damage reduction in rural areas.

1.12 Mitigation/Compensation Measures - The type and extent of fish and wildlife habitat, recreation, and cultural resources mitigation or compensation measures will be determined and coordinated with the public concurrently with preparation and coordination of the site-specific Lake Darling EIS. The Fish and Wildlife Service wishes to acquire breakout points around the Upper Souris Refuge (where the raised flood pool would "break out" of the refuge into private land) so that refuge facilities can be relocated out of the flood pool.

1.13 Compensation to Canada for altered return flows and flowage easements for affected property owners will be determined and negotiated before the Lake Darling Dam is modified.

1.14 Grano Recreation Area - An acceptable disposition of the Grano Recreation Area, which would be affected by the project, will be determined later in the study. This area was financed by a Federal grant under the Land and Water Conservation Fund Act (LAWCON).

1.15 Carp Control Structures - Structural features designed to prevent the undesirable introduction of carp into the North Dakota reaches of the Souris River were recommended for the Burlington Dam project. A thorough analysis of conditions expected from the Lake Darling-Souris River project will be performed to determine if the project could allow carp introduction into the Souris loop. If the results warrant it, carp control structures would be recommended as project features.

1.16 Permanent Flood Protection for the Souris Valley - The most significant unresolved issue that will remain over the long term is the need for permanent, higher-level flood protection for the Souris Valley. The Lake Darling-Souris River project provides only interim, lower-level protection against Souris River floods. The level of protection at Minot would be increased to approximately the 25-year combined Souris and Des Lacs Rivers flood or to a 35-year flood on the Souris River alone. Downstream from Minot, protection would be even less because of the contributions of local tributaries to flood flows. The local interests who signed the 17 June 1981 memorandum of understanding (which proposed the 4-foot Lake Darling raise) agreed to interim protection to break the deadlock between proponents and opponents of the Burlington Dam project. The local citizens also intend to cooperatively investigate alternative measures for a permanent, higher level of protection for Souris Valley residents. The Corps of Engineers hopes to find a solution that will not impose inequitable burdens on any group of valley residents to the advantage of another group - a solution that will not have unpopular economic or environmental impacts in the Souris Valley.

#### Relationship to Environmental Protection Statutes and Other Environmental Requirements

1.17 The proposed project has been reviewed for compliance with applicable environmental laws and regulations for the current stage of planning. Table 1 describes the relationship of the proposed plan to the applicable environmental requirements at this time.

#### Content and Scope of the EIS

1.18 Council on Environmental Quality (CEQ) regulations on the implementation of the National Environmental Policy Act (NEPA) of 1969 (40 CFR 1500-1508) identify a process called "tiering" and define it as "...the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or

ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared..." (40 CFR 1508.28).

1.19 This is the first of at least three EIS's for the Lake Darling-Souris River project. This programmatic EIS will present sufficient information about the general impacts of the project as a whole so that a reasoned judgment can be made on the merits of the action at the present stage of planning. In association with this programmatic EIS, a Velva site-specific EIS (included in this volume following the programmatic EIS) provides a detailed presentation of the impacts of proposed flood control measures at Velva, North Dakota. The site-specific Lake Darling EIS (to be prepared in 1983) will contain a detailed analysis of the impacts of the remaining features of the project. Section 7.00 of this programmatic EIS discusses currently-identified data gaps and studies that will address these issues in greater detail.

## 2.00 NEED FOR AND OBJECTIVES OF ACTION

### Study Authority

2.01 The project for flood damage reduction on the Souris River, North Dakota, recommended by the Chief of Engineers in House Document No. 321, 91st Congress, 2d session, provided for two major structural measures: channel modification through Minot, North Dakota, and upstream reservoir development. The channel modification feature was approved by Senate and House Public Works Committee resolutions adopted 25 June and 14 July 1970, respectively. The reservoir feature was authorized later by the Flood Control Act approved 31 December 1970 (Public Law 91-611). The now-completed Minot channel modification was authorized separately to provide limited flood protection for the city at the earliest possible date. The reservoir feature (the proposed Burlington Dam project) has been deferred by the 1982 Energy and Water Development Act passed by Congress in December 1981. Congress directed the Corps of Engineers to take no further action to construct the Burlington Dam until expressly directed to do so. The Energy and Water Development Act specifically authorized a raise of Lake Darling by approximately 4 feet and implementation of upstream and downstream flood control measures. Most of these measures (including the Velva features) were also part of the Burlington Dam study and are interpreted to be included in the 1982 authorization.

### Public Concerns

2.02 The major concern expressed by Souris Valley residents is the need for flood damage reduction and protection of public health and safety from the Souris River and its tributaries. Although Minot is afforded protection from 16-year floods on the Souris River as a result of the channel modification project, residents consider this level of protection insufficient. Not only are urban areas such as Minot, Velva, and Sawyer subject to flood damages, but rural residents in the Souris Valley suffer both damage to structures and crop delays caused by flooding.

2.03 Concern has also been expressed about Federal land acquisition for this flood control project, with attendant loss of local tax bases and farm production, and the forced relocation of residents. During the Burlington Dam study, many rural Souris Valley residents felt they would bear a disproportionate share of the burden of impacts while urban areas would benefit most from the project. This belief eventually led to a polarization between Souris Valley residents who were for or against implementation of the Burlington project. The Lake Darling project has more widespread support, although certain features are still controversial.

#### Planning Objectives

2.04 In addition to the objective of national economic development, and considerations of environmental quality, regional development, and social well-being, the following specific objectives have been identified for the Lake Darling-Souris River project:

- a. Reduce flood damages in Minot, Velva, Sawyer, other urban areas, and rural lands and developments along the Souris River.
- b. Minimize displacement necessary for project implementation.
- c. Minimize adverse project impacts on local transportation systems.
- d. Minimize project-induced losses to tax bases and farm production.
- e. Minimize adverse impacts caused by the project on recreational resources throughout the Souris Valley.
- f. Preserve the quality of existing fish and wildlife habitat within and outside wildlife refuge boundaries.
- g. Minimize adverse impacts on cemeteries and other cultural and historical resources.
- h. Minimize project effects on Souris River water quality.

### 3.00 ALTERNATIVES

#### No Action

3.01 The no action alternative would involve no action on the part of the Corps of Engineers. No action is not a feasible alternative, however, because the Lake Darling project has been specifically authorized by Congress for implementation. The no action alternative would include continuation of floodplain regulation and flood insurance, the existing channel modifications at Minot, the existing flood forecasting and emergency protection (evacuation and flood fighting), and rehabilitation of Lake Darling Dam to meet current engineering standards (with no increase in flood storage capacity, however). Flooding would continue at the present degree, or would worsen as wetland drainage and development in the Souris and Des Lacs River basins continue.

Minot is presently afforded protection from approximately a 16-year flood from combined Souris and Des Lacs River flows.

#### General

3.02 The proposed flood control plan includes a raise of Lake Darling Dam by approximately 4 feet plus flood control measures upstream and downstream of the dam (see plate 1). Other features considered part of the congressional directive include road and railroad relocations; flood control measures at Velva, Sawyer, and six subdivision areas between Burlington and Minot; flood protection measures for McKinney Cemetery and Renville County Park; floodproofing of residences and/or acquisition of flowage easements downstream of the dam; modification of U.S. Fish and Wildlife Service structures in the Upper Souris National Wildlife Refuge and in the J. Clark Salyer Refuge; mitigation measures; compensation to Canada for altered return flows; and protection measures for flooding from the Gassman Coulee. The Velva levee feature is the only individual project feature that is economically feasible as an additional measure to the raise of Lake Darling Dam.

3.03 A Lake Darling Dam operating plan has been negotiated with the local interests and with the U.S. Fish and Wildlife Service. For small floods (less than 5,000 ft<sup>3</sup>/s or less than a projected 30-day volume of 275,000 acre-feet), dam operation would follow the target flow curve for peak flows at Minot. It would continue the target flow rate of release (a maximum of 5,000 ft<sup>3</sup>/s through 15 May and a maximum of 2,500 ft<sup>3</sup>/s through 1 June) to allow releases of 500 ft<sup>3</sup>/s or natural recession (whichever is less) by 1 June. For large floods (greater than 5,000 ft<sup>3</sup>/s or 275,000 acre-feet projected 30-day volume), dam operation would minimize any releases over 5,000 ft<sup>3</sup>/s. Releases would be at a rate of 5,000 ft<sup>3</sup>/s until a pool level elevation of 1,600 msl is reached. On or about 15 May (or when the pool falls below 1600, whichever is later), releases would be reduced to 2,500 ft<sup>3</sup>/s or less, depending on timing, reservoir stage, and projected inflows). Then on or about 1 June (as long as the storage pool does not exceed elevation 1600), releases would be cut back to 500 ft<sup>3</sup>/s until the conservation pool level of 1596 msl is reached.

3.04 The occasional storage of water at higher stages would require an interest in real estate, such as flowage easements, within the design pool. This real estate includes approximately 800 acres of privately-owned lands upstream of the Upper Souris Refuge, breakout points along the east and west boundary of the refuge, and Renville County Park. Renville County Park will be evaluated for possible levee protection, flood proofing, or acquisition.

3.05 For a maximum reservoir pool of elevation 1605, the crest of the raised dam would be at elevation 1610. The spillway would be located on the left abutment. The low-level outlet would also be located near the left abutment and would have provisions for multi-level release. A public bridge would be provided across the spillway, and the approach roads would be raised to elevation 1610.

3.06 The following roads cross the reservoir and may be affected by short-term flood storage at the flood pool elevation of 1605:

|                        | <u>Bridge Deck<br/>Elevation</u> | <u>Minimum Approach<br/>Elevation</u> |
|------------------------|----------------------------------|---------------------------------------|
| State Highway 5        | 1609.0                           | 1604.8                                |
| State Highway 28       | 1605.5                           | 1605.5                                |
| Renville County Road 9 | 1608.0                           | 1605.0                                |
| Grano Crossing         | 1604.4                           | 1602.4                                |

3.07 The need to raise any of these crossings will be evaluated after the reservoir operating plan is better defined. Protection of the structures to minimize damage from reservoir storage is considered necessary even if the crossings are not raised. Also, the Soo Line railroad crossing at Greene (elevation 1604) may require raising.

3.08 Because the McKinney Cemetery is between elevations 1600 and 1610, it would be partially affected by the design pool level. A levee around the riverward edge of the cemetery is currently the recommended means of protecting this area in lieu of relocation, although this levee would be partially in the Upper Souris National Wildlife Refuge.

3.09 Renville County Memorial Park is located in a loop of the Souris River about 2 miles north of State Highway 5 and, except for some county-owned property, is privately owned. There are about 170 separate ownerships in the park, including 80 cottages (a few of which are permanent residences) and county-owned recreation buildings. With an average elevation of about 1600, the park would therefore be subject to flooding. The four basic options being investigated for this area are:

- a. Fee title acquisition.
- b. Acquisition of flowage easements on the land and flood proofing of the buildings.
- c. Acquisition of flowage easements, removal of the structures, and allowing limited use during the non-flood season.
- d. Construction of a channel cutoff and protection with a levee. This levee would be partly on lands currently owned by the Upper Souris National Wildlife Refuge.

Levee protection is currently viewed as the most favorable alternative.

3.10 One set of farm buildings, the Eckert Ranch, is below elevation 1605. A plan to divert drainage around the farmstead and to protect it with a levee is currently viewed as an acceptable alternative to acquisition of the buildings.

#### Downstream Measures for Reservoir Operation

3.11 The authorization for the project provides for the implementation of downstream measures, including upgrading existing temporary levees and providing interior drainage facilities for residential areas at Velva, Sawyer, and at six subdivisions between Burlington and Minot.

3.12 The downstream features are necessary to prevent urban residential flooding that would be caused by a 5,000 ft<sup>3</sup>/s release rate. The Velva levee feature would protect against a 70-year flood without the Lake Darling Dam raise and against a 100-year flood after the dam raise is completed. The dam raise would provide decreasing levels of protection to each additional downstream urban feature because of the increasing effect of local inflows. The level of protection on the Souris River would range from a 35-year level above the Des Lacs confluence to a 22-year level downstream at Sawyer. Downstream from that point, the level of protection would gradually decline. Except for the Velva features, costs exceed benefits for the urban features.

3.13 In addition to the leveed areas, 113 rural residences have been identified with flood problems at a 5,000 ft<sup>3</sup>/s release rate. Without protection, these structures would remain subject to flooding from reservoir-controlled releases and local inflow. Accordingly, the proposed plan includes a combination of measures including building levees around individual residences, flood proofing, raising of residences, installing holding tanks to temporarily handle sanitary wastes, and flood proofing wells. Where levees and flood proofing would not be feasible, residences would be relocated to adjacent high ground. The plan would not include protection of farm buildings, silos, or any other improvements outside the place of residence. Costs would exceed benefits for most of the downstream rural residential protection features.

#### Refuge Structures

3.14 The U.S. Fish and Wildlife Service has indicated that improvements in the Upper Souris and the J. Clark Salyer Refuges to provide for more intense management would be an acceptable mitigation measure in lieu of land acquisition. Also, because the existing refuge structures may be affected by reservoir operation, Fish and Wildlife Service dams 41, 87, and 96 and maintenance roads are slated for various degrees of upgrading. Modification to the dams would include the spillway at dam 41 and outlet works on dams 87 and 96.

3.15 Because they would be affected by the higher water stages, three boat-launch facilities and service roads above Lake Darling Dam located below elevation 1605 would be modified. Provisions would be made for supplying water to pond A since the removal of the existing outlet structure would eliminate the present source of water. Fencing would be modified because of revised boundaries. A replacement facility for the present spillway fishing area would be provided.

3.16 The recreation area immediately downstream of the Lake Darling spillway would have to be relocated because of the proposed location of the new outlet and spillway. The new site will be determined in the feature design memorandum.

3.17 The gates on all refuge dams in the J. Clark Salyer Refuge would be repaired and equipped with heaters and openers to facilitate winter operation. Also, the low-flow outlet on Fish and Wildlife Service dam 357 would be modified to prevent upstream movement of carp during spring, summer, and fall

releases from the reservoir, if evaluations of flow conditions indicate the project could enable carp to move upstream. Service roads, boat and canoe launching and exit sites, and hiking trails would be raised so that they would be operational during extended high flows.

#### Future Studies

3.18 Local interests will cooperatively investigate alternatives that could achieve further reductions in flood damages for possible implementation after the Lake Darling-Souris River project is in place. Implementing authority for these alternatives could be through a number of political and institutional bodies, including the State of North Dakota, the United States Government, the Canadian Government, and the City of Minot.

3.19 Headwater impoundments and restoration of drained wetlands for flood storage have been considered in past flood control studies on the Souris River. These alternatives, however, lack economic justification and would be difficult to implement (particularly the wetland restoration measure, because of institutional and political difficulties).

3.20 A large dam in the Canadian Province of Saskatchewan is an alternative currently popular with North Dakota residents. This dam would transfer some adverse economic and environmental impacts of a large Souris River dam from North Dakota to Canada. Since a significant percentage of the flood flows reaching Minot have their source in Canada, such a dam would provide flood control benefits to the U.S. portion of the Souris Valley.

3.21 Local urban flood damage reduction alternatives could also be investigated, such as further structural measures in Minot, or floodplain evacuation of mobile home communities.

#### 4.00 AFFECTED ENVIRONMENT

##### Environmental Conditions

4.01 The Souris (also called Mouse) River headwaters are in the Canadian Province of Saskatchewan. The river crosses the international border near Sherwood, North Dakota, and makes a 358-mile loop through Renville, Ward, McHenry, and Bottineau Counties before entering the Province of Manitoba near Westhope. The Souris River basin is an area of approximately 24,800 square miles, of which 15,480 are in Canada and 9,320 are in the United States (almost entirely in North Dakota).

4.02 The existing conditions in the Souris River Valley upstream of Verendrye are those of a small stream in an oversized valley. The valley floor averages three-quarters of a mile wide and lies 100 to 200 feet below the ground-moraine plain. The valley walls are fairly steep-sided. Downstream of Verendrye, the river valley is in the glacial Lake Souris area, is one-half to 3 miles wide, and is relatively flat. Two U.S. Fish and Wildlife Service (FWS) national wildlife refuges, the Upper Souris and the J. Clark Salyer, impound extensive reaches of the upper and lower Souris loop, respectively. The FWS-owned Lake Darling Dam is located in the Upper Souris National



Wildlife Refuge and forms the major impoundment on the Souris River. The primary function of Lake Darling is to supply water to downstream impoundments in both refuges, but it has also been operated to provide some flood storage during spring runoff on the Souris River.

4.03 Agriculture is the primary business in the Souris basin, and there are many small farming communities in the area. Minot is located near the midpoint of the Souris loop and is the region's major center for commerce, manufacturing, and services.

4.04 Land use trends, including floodplain development and both legal and illegal wetland drainage, have apparently contributed to the floodplain problems in the area. Wetland drainage reduces flood storage capacity in the basin and increases runoff into the river and its tributaries.

4.05 The Souris River floodplain forest comprises about 2 percent of North Dakota's forests. This constitutes a significant resource in a State which ranks 50th in the country in total forest acreage.

4.06 The two national wildlife refuges on the Souris River, along with other wetlands in the basin, contribute an important percentage of the State's total annual waterfowl production. The diversity of habitat along the Souris River also supports numerous other wildlife species.

4.07 In a biological opinion dated 4 January 1980, the U.S. Fish and Wildlife Service indicated that the proposed Burlington Dam project would have no adverse effects on threatened or endangered species. The St. Paul District has also initiated formal consultation with the U.S. Fish and Wildlife Service to determine the extent of compliance of the Lake Darling project with the Endangered Species Act. The status of project compliance with the Endangered Species Act of 1973 will be documented in the Lake Darling site-specific EIS. A supplement to the biological assessment in the 1980 supplement to the Burlington Dam EIS will be an exhibit in the Lake Darling site-specific EIS (also see paragraph 7.09 of this programmatic EIS).

4.08 Population in the Souris basin is unevenly distributed among the seven counties:

|                                 | <u>1980 Population</u> |
|---------------------------------|------------------------|
| Bottineau County                | 9,338                  |
| Burke County                    | 3,822                  |
| McHenry County                  | 7,858                  |
| (includes city of Velva 1,101)  |                        |
| Mountrail County                | 7,679                  |
| Pierce County                   | 6,166                  |
| Renville County                 | 3,608                  |
| Ward County                     | 58,392                 |
| (includes city of Minot 32,843) |                        |

Each county's population declined between 1970 and 1980, with an overall regional decrease of 3.5 percent. Although united as the Souris Basin Planning Council (North Dakota Region II), these counties do not yet function in a unified way for water resource management. Each county maintains separate water management districts plus independent taxing and regulating authorities.

#### Significant Resources

4.09 Water Quality - The waters of the Souris River are marginal in terms of both quality and dependability of supply. Flows are generally very low during fall and winter, with frequent periods of no flow lasting from days to months at a time. Non-point source pollution is a major factor in the water quality of the streams in the Souris basin. The North Dakota State Health Department has noted that the quality of surface waters has not improved comparably with the rapid advances that have been made by municipalities, industries, and other point sources in providing adequate treatment of their wastes. The Minot Sewage Treatment Plant is currently the most significant point source on the Souris River. Sewage discharges have caused occasional acute water quality problems. Wetland drainage and channelization of tributaries in the basin also continue to degrade the basin's water quality.

4.10 The State of North Dakota has classified the Souris River as a IA stream. The quality of waters in this class is suitable for the propagation of resident fish species and for boating, swimming, and other water recreation. Treatment for municipal use may require softening, and the treated water must meet bacteriological, physical, and chemical requirements of the State Health Department. The quality of class IA water also permits its use for irrigation, stock watering, and wildlife use without injurious effects.

4.11 North Dakota has classified Lake Darling as a 2C cool water fishery, capable of supporting growth and propagation of non-salmonoid fishes and associated aquatic life. The C-class characteristic (present degree of eutrophication) applies to a lake that is presently somewhat degraded and is progressing toward further degradation.

4.12 Aquatic Resources - Fish species found in Lake Darling and in the Souris and Des Lacs Rivers are generally characteristic of those found in warm-to-cool waters in the Midwest. Twenty-four fish species are known to inhabit the area, with northern pike, fathead minnow, white sucker, black and brown bullhead, yellow perch, and walleye considered very common. Carp are found in the Assiniboine River, and occasionally in the Souris River as far upstream as Melita, Manitoba (river mile 124), where they have surmounted five of six low dams. Carp are not present in the United States portion of the Souris River, however. The absence of carp in J. Clark Salyer NWR (National Wildlife Refuge) is thought to be because of low flow and low dissolved oxygen, which make winter survival difficult.

4.13 Lake Darling currently maintains an excellent walleye and northern pike fishery as a result of natural reproduction, downstream movement of fish from Canadian impoundments, and stocking efforts. The major factors that limit the Lake Darling sport fishery are eutrophication and related algal blooms, silta-

tion, occasional winterkills, and reservoir drawdown for flood control.

4.14 Fish species that inhabit the downstream reaches of the Souris River are similar to those in Lake Darling. Spawning habitat for walleyes in the downstream area is limited to areas below lowhead dams and isolated gravel-rubble-riprap deposits, while northern pike use the Upper Souris NWR marsh units and the J. Clark Salyer NWR. Salyer has extremely good northern pike spawning conditions, but winterkill in the shallow impoundments has limited fishery management efforts in these areas. Other downstream reaches of the Souris River suffer occasional winterkill because of low flows and impaired water quality. Lake Darling is the primary source of fish for repopulating these depleted reaches. In its 1978 Permanent Stream Evaluation, the FWS gave the entire Souris River the highest fishery resource rating.

4.15 Wildlife Resources - The two Souris River national wildlife refuges contain the most valuable wildlife habitat along the river and are important environmental concerns related to the proposed project. The primary purposes of the Upper Souris NWR are production of huntable waterfowl, provision of other necessities in the life cycle of waterfowl, and water supply to J. Clark Salyer NWR (through assured releases from Lake Darling). The refuge also provides habitat for upland and big game, furbearers, and nongame species; winter cover for deer from the surrounding area; public use of refuge-related resources, some haying and grazing, and prevention of waterfowl depredations on private lands. There is also a significant amount of big game hunting on the refuge. J. Clark Salyer NWR, which is larger than the Upper Souris NWR, has similar purposes and uses, except for the water supply function. Both of these refuges serve as vitally important, dependable waterfowl habitat reserves during drought years.

4.16 Floodplain Forest - In terms of acreage, the floodplain forest is the smallest ecological community in the Souris loop, but because this type of vegetation is scarce in North Dakota, it is an important community. The forests in the Souris River between the Saskatchewan border and the upstream boundary of the J. Clark Salyer National Wildlife Refuge represent about 2 percent of the State's total forests. The predominant plant species found in the floodplain forest are elm, green ash, box elder, bur oak, willow, cottonwood, hawthorn, chokecherry, dogwood, wolfberry, and wild rose.

4.17 Wetlands - The three general wetland categories of concern in the Souris basin are riverine wetlands, natural and impounded floodplain wetlands, and prairie potholes.

4.18 About 300,000 acres of wetlands in the Souris basin in North Dakota are considered important to waterfowl. The type and quality of the individual wetlands vary considerably. Easements are held by resource agencies on more than 200,000 acres, and about 43,000 acres are managed exclusively or primarily for fish and wildlife use (Water Resources Management Plan, 1981, Souris-Red-Rainy Region, Upper Mississippi River Basin Commission). The Souris-Red-Rainy Region Basin Commission has estimated that less than half of the original wetland acreage in the basin remains. As the remaining wetlands continue to be drained, waterfowl habitat and other wildlife habitat are

reduced. Wetlands owned and managed for wildlife purposes will become increasingly important as the focus of available waterfowl habitat in the basin.

4.19 Grasslands - Untilled grassland in the floodplain and on valley slopes is usually heavily pastured. Inside refuge boundaries, grassland is maintained for wildlife, with some farming and cattle grazing permitted when compatible. Private and Federal holdings of grasslands total about 15 percent of the land area in the Souris floodplain and roughly 20 percent in the United States portion of the basin (Lunan et al., 1973).

4.20 Agricultural Lands - Agricultural land in the Souris River floodplain is used primarily for small grain (predominantly wheat) and alfalfa farming and grazing. Most agricultural use occurs on formerly native grasslands because the soil types are conducive to dry-land agriculture. At least 11,000 acres of agricultural land downstream of Lake Darling would be affected by the 5,000 ft<sup>3</sup>/s discharge rate of the proposed operating plans. About 1,250 acres upstream of the Lake Darling Dam would be affected by a 35-year flood.

4.21 The Council on Environmental Quality (CEQ) Memorandum on Analysis of Impacts on Prime and Unique Farmlands issued 30 August 1976 directs Federal agencies to determine if their actions would adversely affect prime and unique farmlands, either directly or indirectly, and if so, to seek alternatives with less adverse impacts or to develop mitigative measures that would reduce the loss of value of these valuable agricultural lands. Coordination with the Soil Conservation Service has indicated that prime farmlands would be affected by the proposed flood control project. Varying proportions (by county) of the acreages given above consist of prime farmlands. The potential impacts will be defined in detail in the site-specific Lake Darling EIS.

4.22 Renville County Memorial Park - Renville County Park, located above Lake Darling Dam, is a recreational area and meeting place that has been in use since 1911. Formerly called Mouse River Park, it continues to be a point for political, religious, social, and recreational activities within the Upper Souris River basin. In addition, these activities have given the area a significance in local history. The park has picnic tables, sanitary facilities, a baseball diamond, campsites, playground equipment, picnic shelters, and four group-use buildings for activities such as roller-skating and dancing. Popular recreation activities include swimming, fishing, boating, picnicking, and camping. The social, recreational, and historical impacts of the Lake Darling raise will be further evaluated in the Lake Darling site-specific EIS.

#### Cultural Resources

4.23 In compliance with Section 106 of the National Historic Preservation Act, as amended, the National Register of Historic Places has been consulted. As of 29 June 1982, only one property on the Register, McKinney Cemetery (listed in 1978), would be affected by the raise of Lake Darling or by the downstream levee and channel work. This site is discussed in paragraphs 4.25 and 5.23.

4.24 Archeological and historical surveys of the project area were conducted in 1978 by the University of North Dakota. The historic survey was conducted in an area from the Canadian border south to the Des Lacs-Souris confluence. The archeological survey was conducted in the same area but was much less intensive upstream of Lake Darling. Currently, additional studies are being done to survey the downstream levee and channel work and those areas above Lake Darling that were not covered in the 1978 survey. Also included in this ongoing work is the initiation of a testing program to determine if known sites and those discovered during the present survey are eligible for the National Register of Historic Places. The results of these investigations and the detailed impact assessment will be presented in the Lake Darling site-specific EIS.

4.25 McKinney Cemetery - The McKinney Cemetery was established in the 1880's and includes the gravesites of many of the area's pioneers. Although the cemetery was associated with the former townsite of McKinney, it is still being used by the local residents. This property has been placed on the National Register of Historic Places because of its age and significance to local history. The social and historical impacts of alternatives to protect, raise, or relocate a portion or all of the cemetery will be discussed in greater detail in the site-specific EIS for Lake Darling. Section 106 coordination (Public Law 89-665) has been initiated with the State Historic Preservation Officer.

#### Recreation Resources

4.26 National Wildlife Refuge Recreation Areas - A detailed list of recreation facilities within the Upper Souris and J. Clark Salyer Refuges is not available at this time. However, existing Lake Darling or Souris River access sites are being inventoried, including boat ramps and other structures (picnic tables, parking lots, water supply and sanitary facilities) that may be affected by the project.

4.27 One site that would require relocation is a refuge-operated recreation area located immediately downstream of the existing Lake Darling spillway. This day-use site consists of a picnic area (22 tables) and support facilities.

4.28 Boat landings to be studied further include refuge landings numbers 1, 2, and 3. Landing 1, on the west shore of Lake Darling about 150 yards north of the dam, services the needs of both lake and shore fisherman. Refuge records indicate that this site receives about 10 percent of the total refuge area use. Similar use levels are recorded for landings 2 and 3, also located on the west shore about one-half mile above landing 1.

4.29 Thirty percent of the refuge's annual recreation use has been recorded at Baker Bridge, a 7-acre site located 15 miles north of Minot on Ward County Road 15. This area is used mainly for bank fishing and picnicking. St. Marys Bridge, also known as Silver Bridge, is about 17 miles north of Minot. This bridge accounts for about 10 percent of the recreation use of the refuge.

4.30 Grano Park (Crossing) - Grano Park is located at elevation 1603 on the east shore of Lake Darling. Facilities at this 45-acre site consist of a parking lot, boat ramp, picnic tables, vault toilet, and camping pads. The Renville County Park Board operates and maintains the site, which accounts for approximately 15 percent of total refuge area recreation use. Because construction funds for the park were provided by the Land and Water Conservation Fund, any mitigation plan must be coordinated through the Secretary of the Interior. Previous Corps studies have shown that this site is heavily used by fishermen for access to one of the two areas in Lake Darling open for boat fishing.

4.31 Minot Recreation Areas - The City of Minot Park Board has reported flooding problems at the Souris Valley Golf Course since 1969, and has recorded high costs for restoration of the course after floods during recent years. Much of the cost has been for removal of silt deposits. Bank erosion has also been a problem.

4.32 The Park Board, in recent correspondence with the Corps, has expressed concern over project impacts on an open-space area known as "Bison Plant." This currently unused park is located on the Souris River in the Bell School area. This site and the golf course will both be included in future project studies.

4.33 The Upper Souris Refuge has been identified by the Department of Interior in its ecological theme analysis of the Great Plains Natural Region as having outstanding natural features potentially suitable for receiving a Natural Landmark designation. These features include stable communities of deciduous lowland forests and native grasses and seasonal concentrations of native animals, especially waterfowl. Further coordination with the Denver Field Office of the National Park Service is required to assess project impacts and possible required mitigation measures associated with the Natural Landmark Program (P.L. 74-292).

#### Aesthetic Values

4.34 The areas of highest aesthetic value in the project are the Upper Souris National Wildlife Refuge, the J. Clark Salyer National Wildlife Refuge, and the Souris River Valley between Burlington and the Upper Souris Refuge and between the northern limit of the Upper Souris Refuge and the Saskatchewan border. Aesthetic features include a diversity of habitat types and topographic characteristics. The unique natural characteristics of the Upper Souris Refuge contribute to recognition of the aesthetic value of this area. The woodland acreage of the refuge is also an important component of North Dakota's scarce forest resources. Project area aesthetic resources and beautification plans will be addressed in greater detail in future study documents as required by Corps of Engineers regulations.

#### Social Resources

4.35 Section 122 (P.L. 91-611) Considerations - The following resources addressed by Section 122 of the River and Harbor Flood Control Act of 1970 (P.L. 91-611) would be significantly affected by the proposed project.

4.36 Institutional Arrangements - The basin's social, economic, and political life exists within a framework of legal and habitual arrangements between various organizations and individuals. Three aspects of these institutional arrangements are particularly important for this project: the financial capacity of the revenue system, the network of organizational relationships, and the existing plans for the region and its component areas.

a. Financial capacity is governed by the tax bases and legal limitations of different taxing authorities at the local levels. The State Water Commission's legal limitations would require a specific legislative appropriation before it could provide substantial assistance on the project.

b. Organizational relations are currently not highly coordinated for water resource management, and one group's policies and actions often contradict another's. Recent North Dakota laws encourage appropriate changes, such as floodplain management and basin-wide water resource districts. A coalition (some of whose members are also members of affected political units) has laid the groundwork for a compromise among the different interests who were earlier unable to reach a consensus on the Burlington Dam project.

c. Plans relevant to this project include those objectives and goals of the Souris Basin Planning Council, such comprehensive plans as exist in the region, zoning and land use ordinances, and State policies and plans.

4.37 Social Cohesion - Social cohesion exists in the Souris basin, as elsewhere, among people or groups when there are shared values, interests, and experiences; when neighborhood safety and stability are assured; and when social and political arrangements are perceived as equitable. Cohesion can be disrupted by a failure in these factors and by controversy over specific issues. The earlier conflict over the proposed Burlington Dam was an example of the region's normal cohesiveness being fragmented into opposing interest groups.

4.38 Transportation - Roads and railroads are important links for the cities and farms scattered over the region. Although usually well-maintained, the roads often lack satisfactory alternate routes, particularly in the case of the infrequent bridges over rivers and lakes.

4.39 Future Without-Project Conditions - The following conditions are expected if the proposed project is not implemented.

4.40 Institutional Arrangements - Financial capacity at the State and local levels may become increasingly limited if national and regional economic trends continue. Energy resource development in the State plus world agricultural demand may offset this trend, however.

4.41 Organizational relations are unlikely to change significantly without outside influence.

4.42 Plans in the region would gradually include more participation in the Federal flood insurance program and more conscious land use guidance. Water resource management would probably continue to be fragmented.

4.43 Social Cohesion - Although there would occasionally be sources of conflict in the region, including anxiety and anger over continued flooding, there is no reason to predict a long-term change in the level of social cohesion.

4.44 Transportation - The road network would probably remain much the same, with the possible maintenance problems if the local tax base becomes less secure.

## 5.00 ENVIRONMENTAL EFFECTS

### Significant Impacts

5.01 Further detailed studies are required to provide a better definition of project impacts on the significant resources discussed in the preceding section. The following paragraphs therefore provide only a general overview of potential impacts identified in previous studies of Souris River flood control. Studies that will be done during the next phase of planning are discussed in section 7.00 of this document.

5.02 Water Quality - The raise of Lake Darling, modification of refuge impoundments, and levee and channel modifications could all result in the temporary degradation of water quality. The most apparent impacts would likely be short-term localized increases in turbidity and lowered levels of dissolved oxygen. Lake Darling would be subjected to storage up to about elevation 1600 for the 25-year flood and 1605 for the 35-year flood, increases in depth of about 1 foot and 4 feet, respectively, over existing conditions. Except for any drawdown in anticipation of floods, floods up to the 25-year level should have little effect on Lake Darling, although sedimentation would probably increase slightly due to erosion between the drawdown and storage elevations.

5.03 Holding Lake Darling at elevation 1598 for prolonged periods of time, coupled with periodic inundation at higher elevations, could increase erosion and sedimentation in the reservoir. Although the sedimentation increase is not expected to be large, it could result in increased nutrient loading from ions adsorbed on the sediments, which could aggravate the already eutrophic conditions.

5.04 The reservoir would continue to dilute dissolved salts, settle out suspended solids, and act as a nutrient "sink," reducing nutrient loads downstream. Although the erosive effects of existing peak flood flows would be reduced, long-term release rates at higher than normal flows would exert steady erosive forces at higher bank elevations than under existing conditions. Higher flows should decrease water temperatures and increase the level of dissolved oxygen. Water quality evaluations are currently being performed to determine probable water quality impacts. The evaluation results will be discussed in the Lake Darling site-specific EIS.



5.05 Aquatic Resources - Short-term impacts on the aquatic ecosystem in the Souris Valley would result from project construction activities, including dam construction, modification of refuge impoundments, proposed Velve levee and cutoff construction, and levee construction at other project sites. These impacts would result from direct physical disruption and, more importantly, from increases in suspended sediments that would bury aquatic invertebrates, irritate exposed membranes of fish and invertebrates (possibly to the extent that secondary bacterial infections could occur), and reduce light penetration. All of these effects could reduce aquatic production for several years.

5.06 Drawdown of Lake Darling for flood control could increase the likelihood of fish winterkill. The lake has had winterkill problems after drawdowns in the past when the ice and snow cover was heavy. If drawdowns occur the first winter after a flood storage event, the increased levels of sediments, nutrients, and littoral vegetation decomposition could further aggravate the dissolved oxygen situation in the reservoir.

5.07 Northern pike and yellow perch spawning habitat in the lake may be improved by a raise in elevation of the reservoir for flood storage. However, this potential improvement would depend on factors such as timing and duration of storage and rate of drawdown.

5.08 During years of extended releases following flood storage, higher than normal flows in the Souris River would have both positive and negative effects on the aquatic ecosystem. The erosive effects of existing peak flood flows would be reduced; however, higher summer and possibly fall releases (depending on the operating plan and the severity of the flood) could exert a constant erosive force on the riverbanks at higher than normal elevations. The river could become more turbid and carry a higher silt load, which could cover or scour spawning sites and reduce the quality of aquatic habitat. On the other hand, higher flows could improve fish habitat quality over that which is currently limited by normal low summer flows.

5.09 An analysis will be conducted to determine if carp, presently confined to the lower Souris River downstream of Wawanesa Dam, would be able to migrate up through the Souris loop as a result of the project. This is a prominent concern because of the adverse impact carp have on waterfowl habitat. The proposed plan includes provision for carp control measures if the results of the analysis indicate they are needed. These measures consist of a high-flow/high-velocity channel and a low-flow electric wier at Fish and Wildlife Service dam 357 to prevent carp from migrating upstream.

5.10 Wildlife Resources - The most significant impacts on wildlife resources would result from prolonged discharge flows for flood storage releases from Lake Darling. These releases would hinder current marsh management practices downstream from the dam, especially in the J. Clark Salyer National Wildlife Refuge. Flexibility in raising or lowering pool levels to achieve various refuge management objectives is critical to the success of waterfowl production and other wildlife management goals. Because flows greater than 250 ft<sup>3</sup>/s restrict the drawdown capability (see exhibit 1 - Fish and Wildlife

Service planning aid letter) in the Salyer NWR, an operating plan consisting of a 500 ft<sup>3</sup>/s discharge over the summer would be more detrimental to marsh management than an operating plan consisting of a 5,000 ft<sup>3</sup>/s discharge until the Lake Darling conservation pool level is reached. Although this release rate would render pool level management impossible for a few weeks longer than under normal conditions, the refuge dams could become operable in June, salvaging part of the season's management capability.

5.11 Water level fluctuations in the Lake Darling flood pool would cause changes in shoreline emergent vegetation, floodplain forest, grassland, and agricultural land. The most significant impacts would occur to the marshes and bottomland forests at the north end of the lake. There would be displacements of animal populations during flood storage, and the quality of habitat for certain species could be seriously reduced. The degree of these impacts would depend on several factors, especially the choice of operating plan. This question is still under study.

5.12 Downstream impacts on wildlife would result mainly from extended releases of higher than normal flows. Riparian habitat could be inundated for several weeks or for the entire summer and into fall, depending on the operating plan selected and the severity of the flood. Prolonged inundation could kill certain plant species, altering the composition of the biotic community. In addition, inundated habitat would normally be providing important life requisites such as breeding, nesting, and feeding cover.

5.13 Direct effects of project construction include loss of habitat from clearing, inundation, increased sedimentation, and disturbance of wildlife populations.

5.14 Floodplain Forest - Water level fluctuations in the headwaters of the Lake Darling flood pool could affect the floodplain forest biotic community. The severity of impact would depend on the operating plan, the severity and timing of the flood, the degree of drawdown prior to the flood, the character of the underlying soils, the species composition and phenology of the vegetation, the frequency of flood storage from year to year, and topography.

5.15 Downstream impacts would result from extended discharges during drawdown of the Lake Darling flood pool. Some floodplain forest habitat could be inundated for several weeks or for the entire summer and into fall, depending on the operating plan. Although tolerance of inundation varies widely with different plant species, a change in species composition could take place over the years.

5.16 Trees and other vegetation would have to be removed from several downstream sites of local flood protection features for levee upgrading and channel cutoff construction. The acreage and cover type of vegetation will be determined as more site-specific information becomes available.

5.17 Wetlands - Approximately 1,600 acres of wetlands above Lake Darling Dam to the Saskatchewan border would be subjected to increased flood storage. About 2,200 acres of marsh impoundments are located on the Upper Souris NWR, and over 1,600 acres below Lake Darling. The fringe of emergent vegetation

around Lake Darling could be damaged by fluctuating water levels, increased depth and duration of flooding, and increased ice damage. About 15,000 acres of wetlands downstream of the dam would be flooded by a 5,000 ft<sup>3</sup>/s release. A more precise quantification of wetland acreage in the lower Souris that would be affected by the project will be determined for the site-specific EIS. Project impacts on refuge marsh management are discussed in paragraph 5.10.

5.18 Grasslands - Floodwater storage for even a few days during the growing season would be sufficient to kill the grassland sod. This would be especially true of upland grassland types (both native and introduced species), as opposed to grasses or grass-like types that are more adapted to wet conditions. About 2,000 acres of grasslands between Lake Darling Dam and the Saskatchewan border would be affected by a 35-year flood with the project in place. Duration of inundation would depend on the reservoir operating plan, which would also determine impacts on grasslands downstream.

5.19 Agricultural Lands - Cropland inundated for one growing season could be expected to be reestablished in a monocultural crop (one crop) in 1 to 3 years, depending on the crop. Production would be lost the year inundation occurred. Production losses for the following years would probably depend on the crop and would range from light to heavy. About 1,250 acres of agricultural land upstream of the Lake Darling Dam would be inundated for varying lengths of time by the storage for a 35-year flood. The rate of flood pool recession to the normal operating pool level would depend on the operating plan chosen.

5.20 About 1,800 acres (predominantly hayland) near Towner would be inundated during the summer by the 500 ft<sup>3</sup>/s discharge (for the 35-year flood). Some of this acreage may be prime farmland.

5.21 An undetermined amount of prime farmland soil types would be inundated for varying lengths of time between the elevations of the conservation pool and the flood pool (1598 and 1605, respectively) during flood storage in Lake Darling. Stages and velocities of flood waters on prime farmland in the floodplain downstream would be reduced for floods exceeding the 25-year probability of occurrence, but farmland would be subject to extended periods of inundation from 500 to 5,000 ft<sup>3</sup>/s flows released from Lake Darling. Although the relationship between the location of the project features and prime farmland soil types has not yet been determined, some prime farmland could be lost during construction of these features. Quantification of these potential impacts will be better defined in the site-specific Lake Darling EIS.

5.22 Renville County Memorial Park - Renville County Park is potentially eligible for the National Register of Historic Places. Acquisition or flood-proofing would have an adverse impact upon this resource, while protection of the park by levee construction would have a beneficial effect. Most of the 70-acre site lies approximately at elevation 1600 and would therefore be subject to flooding by the proposed raise in Lake Darling pool elevation. Levee protection is currently viewed as the most favorable alternative for

flood protection because it would protect both the privately-owned and county recreation structures on the site. Archeological surveys are currently underway to determine impacts on this resource.

5.23 McKinney Cemetery - Relocation of the McKinney Cemetery would have an adverse effect upon this National Register of Historic Places site. A raise in place of the cemetery is also likely to have adverse impacts upon the site. The State Historic Preservation Office has preliminarily indicated that construction of a levee would be the most favorable alternative.

#### Cultural Resources

5.24 Under the no action plan, archeological and historical sites upstream and adjacent to Lake Darling would continue to be inundated. A pool raise to 1605 and discharge of 5,000 ft<sup>3</sup>/s to normal pool level would inundate a larger number of cultural resources for a longer period of time. Marginal sites could be affected by erosion and wave action.

5.25 An operating plan that would discharge 5,000 ft<sup>3</sup>/s until 15 May and then greatly reduce discharge during summer months would increase the number of sites presently inundated. Inundation of some sites could extend from spring to fall. Marginal sites could be greatly affected by erosion and wave action.

5.26 Downstream historic structures would be the most likely cultural resources to be affected by acquisition, relocation, or floodproofing. Small ring levees around these structures could affect archeological sites. Overall impacts may be a trade-off between archeological and historic resources. Cultural resources investigations for this feature were not undertaken until the summer of 1983.

5.27 A Gassman Coulee flood warning system could have beneficial effects upon National Register of Historic Places properties within Minot. Acquisition of the Eckert Ranch would adversely effect the Parker Log House, which is potentially eligible for the National Register. Impacts on Renville County Park and McKinney Cemetery are discussed in paragraphs 5.22 and 5.23.

5.28 Construction of levees at Sawyer and six subdivisions between Burlington and Minot could affect archeological and historic resources. A cultural resources survey of these proposed levees was completed in the fall of 1982.

5.29 Three archeological sites could be adversely affected by the work to be done at Fish and Wildlife Service dam 41 and at pools A and B below Lake Darling Dam. One archeological site could be affected by the raise of the Soo Line railroad bridge, while an additional site could be affected by the Highway 28 bridge raise. Presently unknown resources could be affected by work at the Highway 5 and County Road 9 bridges.

#### Recreational Resources

5.30 National Wildlife Refuge Recreation Areas - After inventories of recreation areas in the Upper Souris and J. Clark Salyer Refuges have been completed, a detailed mitigation analysis for project impacts on these

resources will be done. It appears that the day-use recreation site immediately downstream of the existing Lake Darling spillway would have to be relocated because of construction for the proposed new spillway and outlet structures. The new site for this recreation area will be determined in a feature design memorandum.

5.31 Grano Park - Proposed increases in the Lake Darling pool elevation would cause periodic flooding in the Grano Park recreation area. Temporary inundation should not physically affect the parking lot and boat ramp at the park, but further study is necessary to determine the full extent of any temporary flooding or drawdown impacts on these facilities. Permanent picnic tables and a wood frame picnic shelter may also be affected, along with park sanitary facilities. The toilets were not designed to withstand flooding, although the vault design could be modified to provide sealing or emptying during flood events. An existing water supply well would be structurally modified to withstand temporary inundation.

5.32 General adverse impacts on the park would depend upon length of inundation and are expected to include minor damage to existing vegetation, erosion of grass and gravel areas (including camp pads), and an increase in maintenance costs after each inundation.

5.33 Minot Recreation Areas - Further study will be necessary to identify project impacts on both the Souris Valley Golf Course and proposed Bison Plant recreation area. The Minot Park Board has indicated that the proposed Lake Darling release of 5,000 ft<sup>3</sup>/s would inundate the entire course and would generate extensive clean-up costs.

5.34 As noted earlier, raising Lake Darling Dam could have adverse impacts on the existing outstanding natural features within the Upper Souris Refuge that have led to its possible National Landmark designation. The degree of impact would depend on the frequency, elevation, and duration of inundation. Tolerance to inundation varies widely among plant species. For example, some species, especially certain deciduous trees, can be destroyed by a single, relatively short period of flooding, whereas other species can survive annual, long-term inundations. Destruction of plants would also adversely affect various animal species if the plant species involved were important to the animal's habitat requirements.

#### Aesthetic Values

5.35 Increased flood storage could subject elevations of the Lake Darling shoreline between the conservation pool and the flood pool to inundation and subsequent recession of floodwaters. Such increased inundation could produce areas of dead vegetation and mudflats.

5.36 Although the effects of peak flooding would be reduced downstream of the dam, extended releases of between 500 and 5,000 ft<sup>3</sup>/s for varying lengths of time could kill some inundated vegetation and subject some areas to long-term erosive forces. The effect on aesthetics of this area would be adverse until recovery occurs.

### Social Resources

5.37 In compliance with Section 122 of the River and Harbor Act of 1970 (P.L. 91-611), the following social factors were considered and were determined to be not significantly affected by any of the components of the various plans studied at the present level of detail: population mobility and density, housing, noise, education opportunities, public facilities, public services, local/regional activity, real income distribution, employment/labor force, business/industrial activity, agricultural activity, and national defense. These factors will be evaluated further for the Lake Darling site-specific EIS. The effects of the alternatives on floodplain development were also studied in compliance with Executive Order 11988 and are discussed in other sections of this report.

5.38 The potential exists for significant impacts in the following social areas: transportation, local government finance, community cohesion, displacement of people, desirable community growth, health, land use, institutional relationships, man-made resources, natural resources, and air and water quality.

5.39 Institutional Arrangements - A joint water resource board is being organized under the leadership of the Ward County Water Resource District. Under State law, such a joint board would have 6 mills levying capacity. This mill rate would not be adequate to pay for local costs, if the costs are eventually shared at the Army's proposed 35-percent local share. Under this proposed formula, the individual units of local government would not be able to finance the project. The joint board might combine with the cities and, if they secure at least a \$5.7 million contribution from the State, would be able to finance the local share.

5.40 Depending on the sponsor and on the cost-sharing formula, local costs could be shared as follows:

1. Sponsor: Joint Board

"Traditional"  
Cost-Sharing  
Formula  
(Total=\$4,258,000)

Proposed (35%)  
Cost-Sharing  
Formula  
(Total=\$26,706,050)

|  | <u>Minot</u> | <u>Velva</u> | <u>Other</u> |  | <u>Minot</u> | <u>Velva</u> | <u>Other</u> |
|--|--------------|--------------|--------------|--|--------------|--------------|--------------|
| Local Costs                            | 3,832,200    | 212,900      | 212,900      |  | 24,035,445   | 1,335,303    | 1,335,303    |
| Legally Feasible                       | yes          | yes          | *            |  | no           | no           | *            |
| Average Cost to a Residential Property | \$177/yr     | \$90/yr      | -            |  | -            | -            | -            |
| Repayment Period                       | 9 years      | 9 years      | -            |  | -            | -            | -            |

2. Sponsor: Cities

|  |           |         |         |  |            |           |           |
|--|-----------|---------|---------|--|------------|-----------|-----------|
| Local Costs                            | 3,832,200 | 212,900 | 212,900 |  | 24,035,445 | 1,335,303 | 1,335,303 |
| Legally Feasible                       | yes       | no      | *       |  | no         | no        | *         |
| Average Cost to a Residential Property | \$110/yr  | -       | -       |  | -          | -         | -         |
| Repayment Period                       | 20 years  | -       | -       |  | -          | -         | -         |

3. Sponsor: Combined Cities and Joint Board

|  |           |          |         |  |            |           |           |
|--|-----------|----------|---------|--|------------|-----------|-----------|
| Local Costs                            | 3,832,200 | 212,900  | 212,900 |  | 24,035,445 | 1,335,303 | 1,335,303 |
| Legally Feasible                       | yes       | yes      | *       |  | no         | no        | *         |
| Average Cost to a Residential Property | \$110/yr  | \$90/yr  | -       |  | \$598/yr   | \$90/yr   | -         |
| Repayment Period                       | 20 years  | 25 years | -       |  | 20 years   | 20 years  | -         |

\*Other = Many small cities, subdivisions, and individual properties. Although detailed distribution of costs and benefits has not yet been determined, it can be assumed that no stronger tax base exists than Minot's, and therefore the negative effects will be greater.

5.41 Social Cohesion - Although the present project is the result of local political compromises, it has not yet been tested by a larger public opinion. The effect on social cohesion is therefore uncertain. Specific areas of concern include McKinney Cemetery, Renville County Park, perceptions of equity between upstream and downstream interests, and acquisition of homes or property.

5.42 Transportation - Several roads crossing Lake Darling may have to be raised, causing as yet undetermined disruption to traffic. Local roads would bear heavy loads during several construction seasons, causing a temporary deterioration of road conditions. The roads would be restored by the Federal contractors.

#### Other Impacts

5.43 Economically-significant mineral deposits affected would be the sand, gravel, boulders, and clay used for the construction of the proposed structures. The project would not, however, significantly diminish the regional supply of these materials. The project would have no effect on the production and future development of lignite, oil, gas, or salt. The raise of Lake Darling would not inundate large land areas around the lake. Because this area is a national wildlife refuge, mineral development is restricted.

5.44 Executive Order 11988 Floodplain - Floodplain development would not be induced because the project provides less than 100-year protection and requires that floodplain management be undertaken.

5.45 Executive Order 11990, Protection of Wetlands - The Souris River basin contains many important wetlands (as discussed in paragraphs 4.17, 4.18, and 5.17). Because wetland drainage is one of the most prominent public issues, wetlands protection is one of the planning objectives, and evaluation of potential project impacts on wetlands is an important aspect of this flood control study.

5.46 Various features of the proposed project would affect wetlands. The 4-foot raise of the Lake Darling flood pool would affect wetlands adjacent to the lake, particularly in the backwater areas. The extended releases of 500 to 5,000 ft<sup>3</sup>/s for varying lengths of time to achieve flood pool drawdown would inundate many downstream wetlands and severely hamper the drawdown capability of the marshes in both refuges downstream of the dam. Management objectives might not be achievable, and the resulting effect on waterfowl (and other wildlife) production in the refuges could be significant.

5.47 Measures included in the plan to help minimize adverse effects on wetlands are upgrading of structures in the Upper Souris Refuge and in the J. Clark Salyer Refuge. The proposed plan is considered to be responsive to the planning objectives and would not result in unacceptable impacts on wetlands and the environment as a whole.



## 6.00 PUBLIC INVOLVEMENT

6.01 A Notice of Intent to Prepare a Draft Environmental Impact Statement for a Proposed Flood Control Project, Lake Darling, Souris River, North Dakota, appeared in the Federal Register on 28 April 1982. This notice invited participation in the scoping process by anyone who was interested.

6.02 On 14 June 1982, a proposed scope was mailed to interested agencies, organizations, and individuals who indicated an interest in the Burlington Dam project. As required by CEQ regulations (40 CFR 1501.7), the scoping process must be used during preparation of an EIS "for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." A primary purpose of scoping is to make the EIS a more concise, meaningful document that concentrates on the significant issues.

6.03 A final scope was distributed to the public on 5 August 1982. It incorporated the views expressed by Federal, State, and local agencies, organizations, and interested citizens in response to the proposed scope. The St. Paul District has begun coordination with Federal, State, and local agencies and interested citizens to obtain their input into the study process. Informal project information meetings were held with the responsible local governing bodies in Minot and Velva during 1982.

6.04 The Lake Darling draft programmatic EIS, together with the draft Velva site-specific EIS, was distributed to the public in November 1982. A notice of availability appeared in the Federal Register on 12 November 1982. A 45-day review period followed, ending on 27 December. Letters of comments on the documents and the Corps responses to these comments are included in exhibit 2 of the final programmatic EIS and as exhibit 5 in the final Velva site-specific EIS. These comments were used in the preparation of the final EIS's. Those comments applicable to the preparation of the site-specific Lake Darling EIS will be considered during the preparation of that document.

### Required Coordination

6.05 This final EIS, together with the final Velva site-specific EIS, will be filed with the Environmental Protection Agency and distributed to the public. A 30-day public review period will begin when a notice of availability appears in the Federal Register. After this review, a record of decision will be signed and sent to the EPA and other concerned agencies, organizations, and members of the public. The Corps of Engineers will take no administrative action on the proposed project before signing the record of decision.

6.06 Routine coordination with appropriate agencies will continue throughout the study. A draft and final site-specific Lake Darling EIS will be prepared and coordinated with the public in fiscal years 1983 and 1984.

6.07 Because the proposed plan involves placement of fill material in waters of the U.S., a Section 404(b)(1) evaluation of the effects of the fill placement will be prepared for inclusion in the site-specific Lake Darling EIS and submitted to Congress under the provisions of Section 404(r) of the Clean Water Act, Public Law 92-500, as amended. A Section 404(b)(1) evaluation of

the effects of fill placement for the Velva flood control feature is included in the attached Velva site-specific EIS and will be coordinated in the same manner.

6.08 A planning aid letter submitted by the U.S. Fish and Wildlife Service under the provisions of the Fish and Wildlife Coordination Act is included as exhibit 1 of this EIS. A Coordination Act report will be included in the site-specific Lake Darling EIS. The Coordination Act report on the Velva feature is included in the Velva site-specific EIS. Formal consultation with the Fish and Wildlife Service on endangered species, as required by Section 7 of the Endangered Species Act, has been initiated. A supplement to the biological assessment prepared for the 1980 supplement to the Burlington Dam EIS will be in the Lake Darling site-specific EIS.

6.09 The project has been coordinated with the National Park Service and with the State Historic Preservation Officer. The results of all cultural resource investigations will be coordinated with the State Archeologist, the State Historic Preservation Office, the National Park Service, and the Advisory Council on Historic Preservation. The comments of the Advisory Council will be requested in accordance with 36 CFR 800 for all significant cultural resources that may be affected by the proposed project.

#### EIS Distribution

6.10 The individuals and groups listed in exhibit 4 of the Velva feature EIS received either a copy of the draft EIS or a notice of its availability. They will also be sent copies of the final EIS or a notice of its availability.

#### Public Views and Responses

6.11 The authorization for the Lake Darling flood control project resulted from a compromise agreement between the proponents and opponents of the Burlington Dam project. There is general acknowledgment throughout the Souris Valley that flood damage reduction is needed by valley residents as soon as possible and that permanent protection is preferred for the long term. Public opinion also holds that flood protection measures should be acceptable to both those benefited and those adversely affected by the construction of those measures. The formulation of the Lake Darling project has been sensitive to all the public concerns and is an effort to satisfy as many of those concerns as possible within technical, economic, social, and environmental limitations.

6.12 Letters of Comment - All letters of comment received during the official comment period for the draft programmatic EIS are included with the Corps responses in exhibit 2.

6.13 The following paragraphs briefly discuss all substantive comments received on the draft to which the Corps will respond by making major changes in the study decision factors, by supplementing or improving its analyses, or by explaining why a comment warrants no further response.

6.14 U.S. Environmental Protection Agency - The U.S. Environmental Protection Agency (EPA) rated the draft programmatic EIS ER-2. This rating reflects the agency's environmental reservations concerning the water quality impacts of raising Lake Darling and operating it for flood control. It also reflects the EPA's conclusion that improvements are needed in the analysis and disclosure of impacts in the programmatic EIS.

6.15 The EPA believes measures to reduce wetland drainage or restoring drained wetlands would complement the site-specific mitigation measures included in the proposed flood control plan. However, the Corps has no authority under the 1982 Energy and Water Development Act to require reduction of wetland drainage or restoration of drained wetlands on private lands as a requirement for implementing the proposed flood control plan. Wetland protection would be recommended to reduce adverse environmental impacts and reduce further losses to flood storage capacity in the basin.

6.16 The St. Paul District agrees that the draft EIS needed improvements in its analysis and disclosure of impacts. In response to recommendations made to improve discussions in certain principal sections, the final EIS discusses the overall level of protection provided by the project; possible alternatives for increased flood protection; economic questions of costs, benefits, cost distributions, and incremental feasibility of individual features of the proposed plans; and some of the historical background of major project-related decisions.

6.17 U.S. Department of Interior - The United States Department of Interior, Office of Environmental Project Review, was concerned about impacts from the McKinney Cemetery and Renville County Park flood protection measures on national wildlife refuge lands. Habitat losses will be quantified and mitigative measures developed for these features, including the exploration of a possible land exchange with Renville County.

6.18 The Department of Interior recommended consideration of measures to reduce the feedlot runoff problem into Lake Darling from Eckert Ranch. If a levee and diversion channel for bluff drainage are implemented as the protection for Eckert Ranch, feedlot runoff reduction would be accomplished because some water would be diverted away from the feedlots before reaching them, thereby reducing one of the sources of the problem. Because modifications to the J. Clark Salyer water control facilities are already included in the project to partially compensate for the reduced water management capabilities caused by the project, the St. Paul District agrees with the recommendation to raise embankments to increase pool storage capacities if the results of the habitat impact analysis warrant such an embankment raise.

6.19 The Department of Interior was concerned about historical resources affected by the project. Detailed information on impacts will be included in the Lake Darling site-specific EIS. Mitigation measures and documentation of coordination will be presented in a cultural resources feature design memorandum.

6.20 The Department of Interior was also concerned about prime farmland and mineral resources. Quantification of project impacts on prime farmlands will be included in the upcoming site-specific EIS. Project impacts on mineral resources would be acceptable.

6.21 U.S. Forest Service - The U.S. Forest Service was concerned about potential direct and indirect (induced development) adverse project impacts on forest land, water quality, and wildlife habitat. A more detailed analysis of potential impacts on these resources will be in the Lake Darling site-specific EIS.

6.22 The St. Paul District agrees with most of the Forest Service comments. However, an evaluation of aerial photos and topographic delineation of flood discharge outlines downstream of the dam indicates that the level of increased flood protection downstream is generally insufficient to warrant widespread or significant induced development on forest lands. Some small blocks of woodlands in isolated areas could have a potential for clearing, but the incentive for clearing will be reduced because of the potential for remaining flood damages on frequently flooded areas.

6.23 The Forest Service also recommended that losses to native forest lands be mitigated on a 2 to 1 basis. The Corps will quantify adverse impacts to forest lands and will consider the recommended level of planting for forest land mitigation during development of the mitigation plan for the Lake Darling site-specific EIS.

6.24 U.S. Soil Conservation Service - The U.S. Soil Conservation Service reaffirmed its position that the Lake Darling site-specific EIS must definitively quantify and analyze effects of potential impacts on prime farmlands. The St. Paul District intends to further define impacts on prime farmlands, as stated, in the draft and final EIS.

6.25 U.S. Department of Housing and Urban Development - The U.S. Department of Housing and Urban Development, Office of Regional Community Planning and Development, recommended that the site-specific Lake Darling EIS address the housing needs of the projected workforce and project impacts on community parks and open space lands. These subjects will be addressed in the Lake Darling site-specific EIS.

6.26 North Dakota State Highway Department - The North Dakota State Highway Department was concerned about temporary and permanent disruption to the transportation system during and after construction. The St. Paul District reaffirmed its commitment that equal replacement of State and county roads affected by the raise of Lake Darling Dam is part of the project cost.

6.27 Mr. Lloyd B. Huesers - Mr. Lloyd B. Huesers, a citizen and park commissioner of the city of Minot, felt that the Corps of Engineers policies were partly responsible for flood damages to the Souris River Golf Course west of Minot and that the Corps should therefore provide flood protection for the golf course. If the evidence shows that the golf course receives overall negative impacts from the operation of the project, an easement payment would be made, which would be viewed as a non-federal cost.

6.28 Mrs. James Munt - Mrs. James Munt, a property owner in Renville County Park, was concerned about the effects of the proposed levee alternative on her property. Mrs. Munt received a sketch of the approximate levee alignment and channel diversion so that she could plot the location of her property in relation to the proposed alignments. Because the Lake Darling raise would occasionally affect the park by flood storage, some type of flood protection is necessary. A levee alternative is one of the alternatives considered. Analysis and coordination with local interests indicate the levee alternative is preferred to fee title acquisition or flowage easements and floodproofing of structures. Therefore, the levee alternative was the recommended action in the Corps general design memorandum completed in June 1983.

#### 7.00 SUPPLEMENTARY ENVIRONMENTAL DOCUMENTATION

7.01 The tiering concept has been chosen to satisfy the NEPA requirements for the Lake Darling flood control project (see paragraphs 1.02, 1.18 and 1.19). Because only general environmental impacts have been discussed in this programmatic EIS, the information must be supplemented in a site-specific Lake Darling, Souris River, EIS so that a more detailed analysis of impacts can be made. The purpose of this section is to identify the studies and coordination with other agencies that must be done before the site-specific EIS.

#### Fish and Wildlife Resources

7.02 A detailed analysis of conditions expected from proposed project operation will be conducted to determine if the project would increase the likelihood of carp migration up the Souris River loop. If study results indicate that the likelihood would increase, carp control measures will be added to the project design.

7.03 Potential project impacts on aquatic habitats both within and downstream of Lake Darling Dam will be studied in detail. Of particular concern are effects of construction and operation on existing fisheries resources. Using available hydrological information, the St. Paul District will also evaluate project effects on water level management and associated habitat management objectives on the J. Clark Salyer Refuge.

7.04 Impacts on terrestrial habitats of the lower Souris River from construction and operation of the overall project and of the individual features will be specifically determined.

7.05 The location and extent of breakout points along the Upper Souris Refuge boundary, relocations of refuge facilities, and the type of land to be acquired will be addressed.

7.06 Determining construction-related impacts will require site-specific location and cover typing of all areas to be affected. These areas include borrow sites, excess material disposal sites, work-staging areas, site limits of the dam and spillway, roads, and other related facilities. Impacts of required channel modification will also be assessed.

7.07 An analysis of proposed operating plans and hydrographs for a range of floods will be refined to determine area and degree of habitat impacts from inundation.

7.08 A draft Fish and Wildlife Coordination Act report submitted by the U. S. Fish and Wildlife Service will be in the Lake Darling draft site-specific EIS.

7.09 A supplement to the biological assessment in the 1980 supplement to the Burlington Dam EIS will be in the Lake Darling site-specific EIS. This supplement to the biological assessment will document the compliance of the project with the Endangered Species Act of 1973, as amended.

#### Water Quality

7.10 Additional water quality evaluations are currently underway to define probable water quality impacts both within and downstream of the reservoir. The results of the evaluations will be discussed in the Lake Darling site-specific EIS.

7.11 A Section 404 (b) (1) evaluation of the effects of fill placement in waters of the U.S. will be in the Lake Darling site-specific EIS. This evaluation will be submitted to Congress under the provisions of Section 404 (r) of the Clean Water Act. The public will have the opportunity to request a public hearing after distribution of the Section 404 (b) (1) evaluation and the Lake Darling site-specific draft EIS.

#### Prime Farmlands

7.12 Impacts on prime farmlands will be quantified and assessed. Acreages of affected prime farmland will be included in the Lake Darling site-specific EIS.

#### Cultural Resources

7.13 Intensive surveys of all project features, except downstream flood protection of rural residences, were completed during the 1982 field season. A survey of downstream residences will be undertaken when they are identified as possible project features. Future work will focus on intensive testing and documentation of archeological and historic resources for evaluation against the criteria for inclusion on the National Register of Historic Places.

7.14 Coordination will be maintained with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. A cultural resources feature design memorandum will be prepared for Lake Darling that will outline a mitigation plan for significant resources and that will include an executed memorandum of agreement in accordance with the Advisory Council regulations (36 CFR Part 800).

### Social Resources

7.15 Detailed studies of social resources will include an evaluation of impacts on transportation, acquisition and floodproofing of residences, institutional changes, and construction-related impacts on housing, education, and labor.

7.16 The issues of wetland drainage and floodplain management will be examined further in relation to the social conditions in the study area. The current social significance of McKinney Cemetery will also be investigated in more detail.

### Recreational Resources

7.17 An intensive inventory of Souris River Valley recreational resources and a subsequent evaluation of potential project impacts on those resources will be conducted.

### Mitigation/Compensation

7.18 After detailed determinations of project impacts on fish and wildlife resources, cultural and historical sites, forest lands, and recreation areas, the mitigation/compensation features for these resources must be developed, coordinated with the public, and recommended for inclusion as specific project features.

7.19 Compensation to Canada for altered return flows and flowage easements for affected property owners will be determined and negotiated before the Lake Darling Dam is modified.

# LIST OF PREPARERS

The following people were primarily responsible for preparing this final environmental impact statement: -

| <u>Name</u>         | <u>Discipline/Expertise</u>              | <u>Experience</u>   | <u>Role in Preparing EIS</u>   |
|---------------------|--|---|--|
| Ms. Jeannie Wagner  | Biology/Wildlife                         | 4 years EIS studies, St. Paul District  | Effects on water quality, fish and wildlife resources, vegetation, prime farmlands; primary preparation of EIS |
| Mr. Jim Holleran    | Outdoor Recreation Planner               | 9 years resource planning St. Paul District   | Effects on recreation, aesthetics, and related resources   |
| Ms. Suzanne Gaines  | Sociologist                              | 4 years EIS studies, St. Paul District  | Effects on social resources, institutional relationships   |
| Mr. David Berwick   | Archeology/Cultural Resources Management | 4 years cultural resources management & EIS studies, St. Paul District; 2 years cultural resources management, Memphis District | Effects on historical, architectural and archeological resources   |
| Mr. Robbin Blackman | Biology/Fisheries                        | 13 years EIS studies, Corps of Engineers  | EIS Coordinator  |
| Mr. David Loss      | Engineering/Civil, Water Resources       | 12 years, project management, St. Paul District, Corps of Engineers   | Study Manager  |



#### REFERENCES

- Lunan, J.S., T. Glorvigen, and G. Leslie. 1973. Biological and recreational impacts of nine proposed flood control alternatives in the Des Lacs and Souris River flood plains, North Dakota. Minot State College.
- Malcolm, Jon M. 1979. The relationship of wetland drainage to flooding and water quality problems and its impacts on the J. Clark Salyer National Wildlife Refuge. U.S. Fish and Wildlife Service. Department of the Interior.
- U.S. Army Corps of Engineers. Contract No. DACW37-73-C-0001. St. Paul District.
- U.S. Army Corps of Engineers. 1977. Draft environmental impact statement, flood control, Burlington Dam, Souris River, North Dakota. St. Paul District.
- U.S. Army Corps of Engineers. 1980. Draft supplement to the environmental impact statement, flood control, Burlington Dam, Souris River, North Dakota. Endangered species biological assessment and Section 404(b)(1) evaluation. St. Paul District.
- U.S. Environmental Protection Agency. 1971. Water quality investigation, Souris River basin, North Dakota, 1969. Water Quality Office, Region VII. Kansas City, Missouri.
- U.S. Fish and Wildlife Service. 1978 stream evaluation map, North Dakota. Office of Biological Services. Denver, Colorado.
- Upper Mississippi River Basin Commission. 1981. Water resources management plan, Souris-Red-Rainy region. Volume 2, Souris River basin. Subregion 0901. Souris-Red-Rainy Regional Committee.

Table 1. Relationships of the Proposed plan to Environmental Requirements

| Federal Statutes   | Proposed Plan | No Action |
|--|---------------|-----------|
| Archaeological and Historic Preservation Act, as amended, 16 U.S.C. 469, et seq.           | Full          | N/A       |
| Clean Air Act, as amended, 42 U.S.C. 7401, et seq.   | Full          | Full      |
| Clean Water Act, as amended (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq. | Full          | Full      |
| Coastal Zone Management Act, as amended, 16 U.S.C. 1451, et seq.                           | N/A           | N/A       |
| Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.                        | Full          | Full      |
| Estuary Protection Act, 16 U.S.C. 1221, et seq.  | N/A           | N/A       |
| Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1(12), et seq.             | Full          | Full      |
| Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.                     | Full          | Full      |
| Land and Water Conservation Fund Act, as amended, 16 U.S.C. 4601-4601-11, et seq.          | Full          | Full      |
| Marine Protection, Research and Sanctuaries Act, 22 U.S.C. 1401, et seq.                   | N/A           | N/A       |
| National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, et seq.             | Full          | Full      |
| National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et seq.            | Full          | N/A       |
| Rivers and Harbors Act, 33 U.S.C. 401 et seq.  | N/A           | N/A       |
| Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.                     | N/A           | N/A       |
| Wild and Scenic Rivers Act; as amended, 16 U.S.C. 1001, et seq.                            | Full          | Full      |
| <u>Executive Orders, Memoranda</u>   |               |           |
| Floodplain Management (EO 11988)   | Full          | Full      |
| Protection of Wetlands (EO 11990)  | Full          | Full      |
| Environmental Effects Abroad of Major Federal Actions (EO 12114)                           | Full          | N/A       |
| Analysis of Impacts on Prime and Unique Farmlands, CEQ Memorandum 30 August 1976           | Full          | Full      |
| State and Local Policies   | Full          | Full      |
| Land Use Plans   | Full          | Full      |
| <u>Required Federal Entitlements</u>   |               |           |
| U.S. Fish and Wildlife Service Special Use Permit  | N/A           | N/A       |

NOTES: The compliance categories used in this table were assigned according to the following definitions.

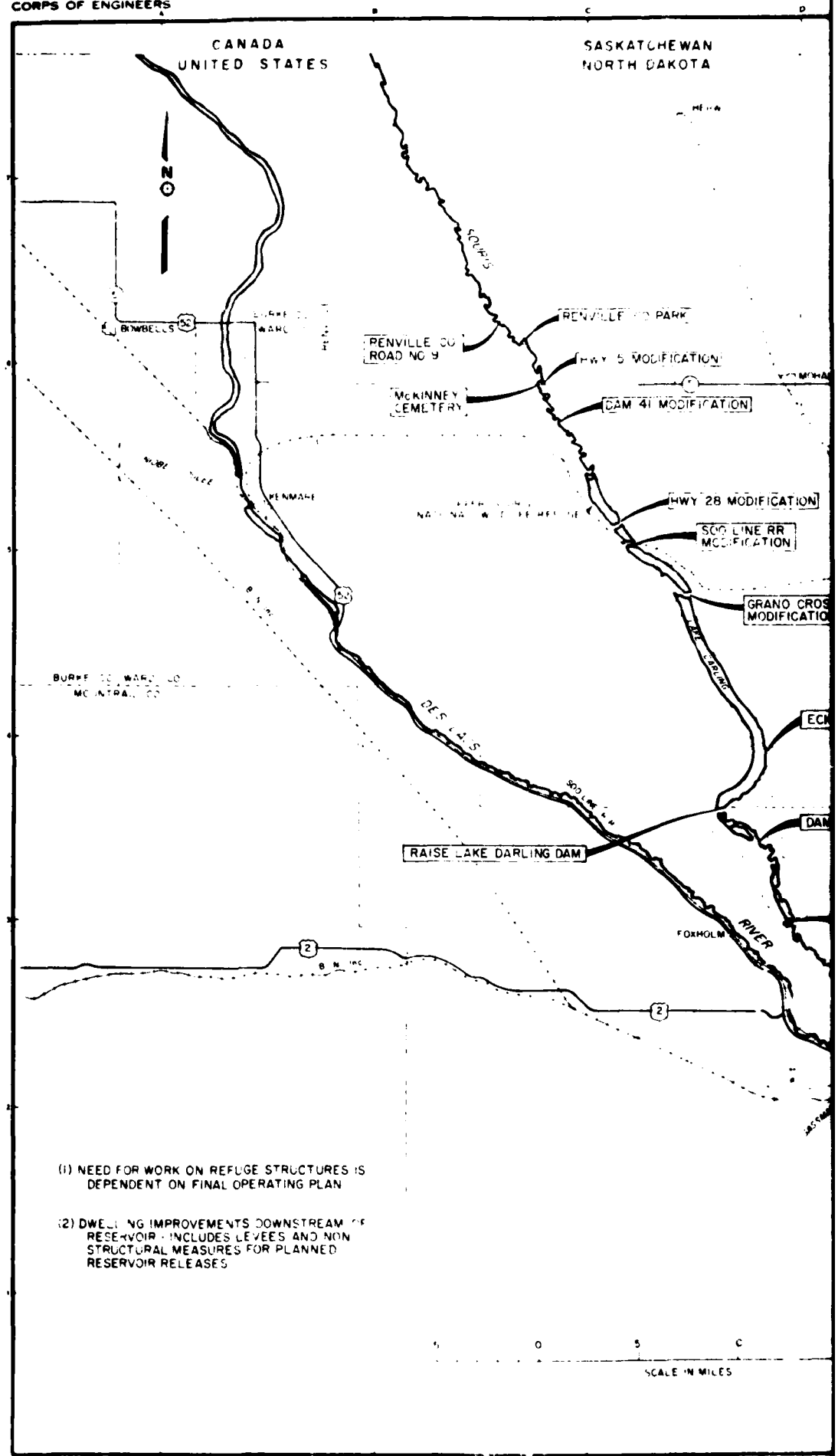
- Full compliance - All requirements of the statute, E.O., or other policy and related regulations have been met for the current stage of planning.
- Partial compliance - Some requirements of the statute, E.O., or other policy and related regulations remain to be met for the current stage of planning.
- Noncompliance - Violation of a requirement of the statute, E.O., or other environmental requirement.
- Not applicable (N/A) - Statute, E.O., or other policy not applicable for the current stage of planning.

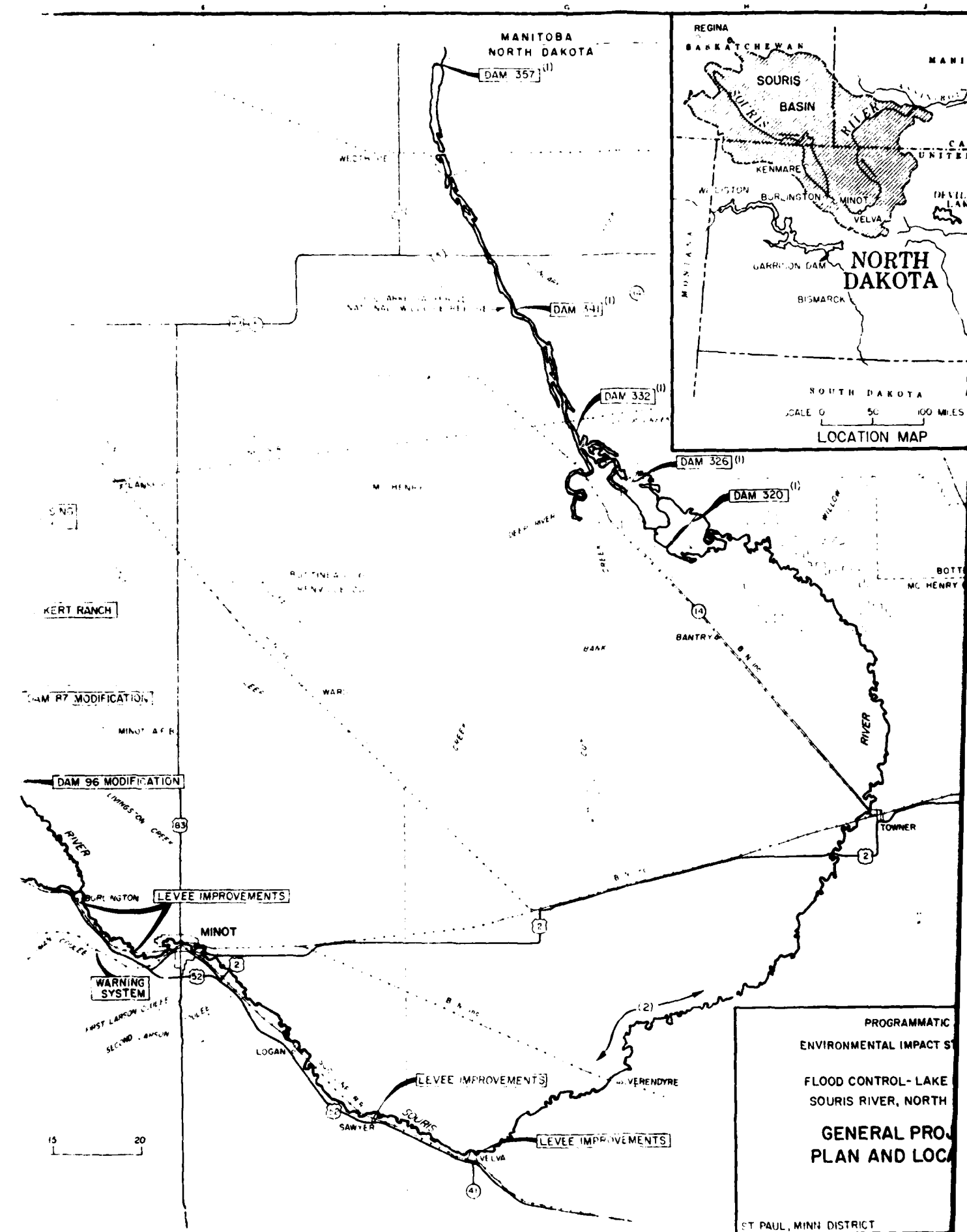
Table 2 - Comparative Impacts of Alternatives and Features

| Plan Features and Alternatives   | Water Quality   |                       | Aquatic Resources   |                       | Wildlife Resources  |                       | Vegetation   | Reynolds Co. Park     |   | McKinney Cemetery     |   |
|--|---|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|---|
|  | Significant Resources   | Significant Resources | Significant Resources   | Significant Resources | Significant Resources   | Significant Resources | Significant Resources  | Significant Resources | Significant Resources   | Significant Resources | Significant Resources   |
| Base Condition   |   |                       |   |                       |   |                       |  |                       |   |                       |   |
|  | Souris River is a class 1A stream. Lake Darling is a class 2C lake; eutrophic.  |                       | Souris River is carp-free in North Dakota; has a diversity of other fish species. Lake Darling has a good quality northern pike and walleye fishery.  |                       | Upper Souris and J. Clark Salzer National Wildlife Refuge are significant waterfowl production areas; river wetlands in North Dakota; river wetlands in North Dakota; river wetlands in North Dakota. |                       | There are about 7,950 acres of forest and 300,000 acres of wetlands in North Dakota; river wetlands in North Dakota; river wetlands in North Dakota.   |                       | 5 permanent county buildings; 70 summer homes, about 5 permanent residences; 70-acre site at 1606 rail; day and overnight county owned and operated park.   |                       | A National Register of Historic Places property.  |
| No Action (Without-Project)  | Souris River will continue to suffer from both point and non-point source pollution problems. Lake Darling will continue trend toward eutrophy.                               |                       | Aquatic habitats would continue to suffer from both point and non-point source pollution problems; winter-kills may recur in Lake Darling and J. Clark Salzer Refuge.   |                       | Losses of wetland habitat would continue in the basin.  |                       | Continued drainage of wetlands in the basin; agricultural drainage will increase.  |                       | Existing impacts would continue.  |                       | Existing impacts would continue.  |
| Pool Raise to 1605; Operation Plan: discharge 5000 ft <sup>3</sup> /s to normal pool level.  | Some increase in sedimentation in Lake Darling. Extended discharge could increase riverbank erosion downstream. No significant changes in overall water quality are foreseen. |                       | Short-term sedimentation impacts during construction; Lake Darling would suffer from both point and non-point source pollution problems. Extended discharge could have both beneficial and adverse effects on aquatic habitat downstream. |                       | Extended discharges would affect riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat.               |                       | Water level fluctuations in Lake Darling would affect riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat. |                       | Stage and duration would increase impacts on riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat.         |                       | Stage and duration would increase impacts on riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat.         |
| Pool Raise to 1605; Operation Plan: discharge 5000 ft <sup>3</sup> /s to normal pool or 9/1 then 700 ft <sup>3</sup> /s to recession.  | See above.  |                       | See above.  |                       | Similar to above; effects on marsh level management could be worse.   |                       | See above.   |                       | Stage and duration would greatly increase impacts on riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat. |                       | Stage and duration would greatly increase impacts on riparian habitat and adversely affect downstream riparian habitats; water level fluctuations in Lake Darling could adversely affect shoreline habitat. |
| Pool Raise to 1605; Recommended Operation Plan: until pool level reaches 1605 or 5/15 discharge 5000 ft <sup>3</sup> /s until 6/1; 2500 ft <sup>3</sup> /s until 6/1; 500 ft <sup>3</sup> /s to normal pool level. | Effects would be intermediate in degree between above 2 plans.  |                       | Effects would be intermediate in degree between above 2 plans.  |                       | Effects would be intermediate in degree between above 2 plans.  |                       | Effects would be intermediate in degree between above 2 plans.   |                       | Effects would be intermediate in degree between above 2 plans.  |                       | Effects would be intermediate in degree between above 2 plans.  |
| Reynolds Co. Park Acquisition/Relocation   | Possible minor improvement if relocation is out of floodplain.  |                       | Possible minor improvement if relocation is out of floodplain.  |                       | Minor improvement dependent on relocation site.   |                       | If structures were removed, site could revert to natural vegetation at relocation site.  |                       | See Cultural and Recreational Resources and Social Cohesion.  |                       | See Cultural Resources and Social Cohesion.   |
| Floodproofing  | Some improvement from sewage system upgrading.  |                       | Minor improvement from sewage system upgrading.   |                       | No effect.  |                       | No effect.   |                       | Same.   |                       | No effect.  |
| Levees and channel cutoff  | Same.   |                       | Same.   |                       | Minor losses of habitat.  |                       | Some clearing during construction.   |                       | Same.   |                       | No effect.  |
| McKinney Cemetery Relocation   | No effect.  |                       | No effect.  |                       | Minor long-term increase in available habitat.  |                       | Site could revert to natural state; loss of vegetation at relocation site.   |                       | No effect.  |                       | See Cultural Resources and Social Cohesion.   |
| Raise in place   | Negligible.   |                       | Negligible.   |                       | Negligible.   |                       | Negligible.  |                       | Same.   |                       | Same.   |
| Levee protection   | Possible short-term increase in turbidity during construction.  |                       | Possible short-term minor impact during construction.   |                       | Minor loss of habitat.  |                       | Minor clearing for levee construction.   |                       | No effect.  |                       | Same.   |
| Downstream Rural Protection Acquisition/Relocation   | Possible minor improvement in some cases.   |                       | Possible minor improvement in some cases.   |                       | Negligible.   |                       | Negligible.  |                       | No effect.  |                       | No effect.  |
| Floodproofing  | No effect.  |                       | No effect.  |                       | No effect.  |                       | No effect.   |                       | No effect.  |                       | No effect.  |
| Levees, dikes  | Possible short-term increases in turbidity during construction.   |                       | Short-term adverse effects during construction; some decline in habitat quality possible.   |                       | Decreases in habitat quantity and quality due to clearing.  |                       | Some clearing of floodplain forests; some losses of other vegetation types.  |                       | No effect.  |                       | No effect.  |
| Levees at Sawyer and 21st Subdivisions   | Short-term increases in turbidity during construction. Some adverse effects due to loss of riparian cover.  |                       | Disruption of habitats in floodplain; some adverse effects downstream during construction.  |                       | Disruption of habitat during construction; some adverse effects on other vegetation during construction.  |                       | Disruption of managed marshes during construction; some adverse effects on other vegetation during construction.   |                       | No effect.  |                       | No effect.  |
| Modify Upper Souris Refuge Structures  | Short-term construction impacts.  |                       | Long-term minor improvements possible.  |                       | Effect would depend on relocation site.   |                       | Some losses of vegetation at relocation site.  |                       | No effect.  |                       | No effect.  |
| Schert Ranch Acquisition/Relocation  | Long-term minor improvement possible.   |                       | Long-term minor improvements possible.  |                       | Minor losses of habitat.  |                       | Minor losses from clearing.  |                       | No effect.  |                       | No effect.  |
| Levees/dikes   | Possible short-term increases in turbidity during construction.   |                       | Possible short-term adverse effects during construction.  |                       | No effect.  |                       | No effect.   |                       | No effect.  |                       | No effect.  |
| Gusman Conline   | No effect.  |                       | No effect.  |                       | No effect.  |                       | No effect.   |                       | No effect.  |                       | No effect.  |
| No Action  | No effect.  |                       | No effect.  |                       | No effect.  |                       | No effect.   |                       | No effect.  |                       | No effect.  |
| Flood Warning System   | No effect.  |                       | No effect.  |                       | Short-term disruption of habitat during construction.   |                       | Minor vegetation removals during construction.   |                       | No effect.  |                       | No effect.  |
| Road and Rail Bridges  | Short-term construction impacts.  |                       | Short-term construction impacts.  |                       | Short-term construction impacts.  |                       | Short-term construction impacts.   |                       | No effect.  |                       | No effect.  |

Table 2 - Comparative Impacts of Alternatives and Features (Continued)

| Plan feature and alternative  | Cultural Resources  | Recreational Resources  | Aesthetics   | Institutional Arrangements  | Social Concerns   | Transportation  |
|---|---|---|--|---|---|---|
| <b>Base Condition</b>   | 12 known archaeological sites, 8 historic structures (including 1 small building of historic place) above Lake Burling; 18 known archaeological sites, 18 historic structures adjacent to Lake Burling. | Refuge landings day-use areas, 2 county parks, several minor recreation areas and informal rec. use sites at bridge crossing within study area. | Scenic River Valley contains a variety of landscape, vegetation, and wildlife, providing important scenic qualities in the basin.  | Summer overcast financial capacity; low formal coordination between water resource/political organizations; some formal planning documents and mechanism available.       | Majority of conflict related to a earlier flood control proposal; a compromise plan has been developed by various groups and individuals. | Road network basically adequate and usually well maintained.              |
| <b>No Action (Without-Project)</b>  | Existing impacts would continue.  | Existing impacts would continue.  | May decline because of wetland drainage.   | Gradually worsening financial condition; low formal coordination unlikely to increase without greater State pressure; gradual increase in floodplain/land use management. | No predictable changes.   | No change in network, but existing network may have maintenance problems. |
| <b>Pool Raise to 1405; Operation Plan: 5000 ft<sup>3</sup>/s discharge to normal pool level.</b>  | Increase in number of sites impacted because of increased duration of inundation, and erosion potential.  | Partial loss of rec. use day-use areas; minor damage to some recreation resources.  | Fluctuating water levels in Lake Burling could kill or damage shoreline vegetation, causing degradation of floodplain; erosion of floodplain downstream could adversely affect aesthetics of riparian areas. | Strain on financial capacity; increasing organizational complexity and interdependence among governmental units; some formal planning documents and coordination.         | Uncertain acceptability of project details (see below).   | No effect.  |
| <b>Pool Raise to 1405; Operation Plan: 5000 ft<sup>3</sup>/s discharge to 5/15; 500 ft<sup>3</sup>/s to normal pool level; 100 ft<sup>3</sup>/s to recession.</b>             | See above.  | Loss of early season recreation use; minor adverse impact on spring fishing access; partial damage of recreation resources.                     | See above.   | Same.   | Uncertain acceptability of project details (see below).   | No effect.  |
| <b>Pool Raise to 1405; Recommended Operation Plan: 5000 ft<sup>3</sup>/s discharge to 5/15; 500 ft<sup>3</sup>/s to normal pool level; 100 ft<sup>3</sup>/s to recession.</b> | Effects would be intermediate in degree between above 2 plans.  | Effects would be intermediate in degree between above 2 plans.  | Effects would be intermediate in degree between above 2 plans.   | Effects would be intermediate in degree between above 2 plans.  | Effects would be intermediate in degree between above 2 plans.  | Effects would be intermediate in degree between above 2 plans.            |
| <b>Burling Co. Park Acquisition/Relocation</b>  | Adverse impacts on historic structures from removal.  | Adverse impact on regional recreational resources.  | Relocation site would not likely be as attractive as present site.   | Same.   | Uncertain acceptability of alternatives for Burling County Park.  | No effect.  |
| <b>Floodproofing</b>  | Adverse impact on historic structures from floodproofing.   | Loss of recreational use days during construction for ramping and some day-use activities.  | Floodproofed structures could be less attractive.  | Same.   | Same.   | No effect.  |
| <b>Levees and Channel Cutoff</b>  | Beneficial impact on historic structures.   | Would provide protection for recreational resources and maintain existing use levels.   | Losses of riparian vegetation could result in less attractive surroundings.  | Same.   | Same.   | No effect.  |
| <b>McKinney Cemetery Relocation</b>   | Adverse impact on RHPD property.  | No effect.  | Effect would depend on relocation site.  | Same.   | Uncertain acceptability of alternatives for McKinney Cemetery protection.   | No effect.  |
| <b>Raise in Place</b>   | Minimal impact on RHPD property.  | No effect.  | Short-term adverse effect.   | Same.   | Same.   | No effect.  |
| <b>Levee Protection</b>   | Minimal impact on RHPD property.  | No effect.  | Possible adverse effect.   | Same.   | Same.   | No effect.  |
| <b>Downstream Rural Protection Acquisition/Relocation</b>   | May alter some potentially historic structures.   | No effect.  | Effect would depend on individual cases.   | Same.   | Uncertain acceptability of alternatives for downstream rural flood protection.  | Some disruptions to traffic during construction.                          |
| <b>Floodproofing</b>  | May alter some potentially historic structures.   | No effect.  | Floodproofed structures could be less attractive.  | Same.   | Same.   | Same.   |
| <b>Levees, Dikes</b>  | May adversely affect unknown archaeological resources.  | No effect.  | Possible adverse effect.   | Same.   | Same.   | Same.   |
| <b>Levees at Sanger and Six Subdivisions</b>  | May have adverse effect on historical and archaeological properties.  | No effect.  | Losses of riparian vegetation would result in less aesthetically pleasing surroundings.  | Same.   | Uncertain acceptability of levee alternatives.  | Some disruptions to traffic during construction.                          |
| <b>Buildup Upper Sanger Refuge Structures</b>   | Notification of dam A1 could affect 2 sites; work on ponds A or B could impact 1 site not eligible for RHPD.  | Minor impact on refuge recreation sites; limited impact on rec. use days.   | Negligible.  | Same.   | Same.   | Same.   |
| <b>Robert Bench Acquisition/Relocation</b>  | Will have adverse effect on historic properties.  | No effect.  | Effect would depend on relocation site.  | Same.   | No effect.  | No effect.  |
| <b>Levees/Dikes</b>   | Will have beneficial effect on historic properties.   | No effect.  | Possible adverse effect.   | Same.   | No effect.  | No effect.  |
| <b>Graham Coulee No Action</b>  | Existing impacts on RHPD property in flood would continue.  | No effect.  | No effect.   | Same.   | No effect.  | No effect.  |
| <b>Flood Warning System</b>   | May have beneficial effect on RHPD property in flood.   | No effect.  | No effect.   | Same.   | No effect.  | No effect.  |





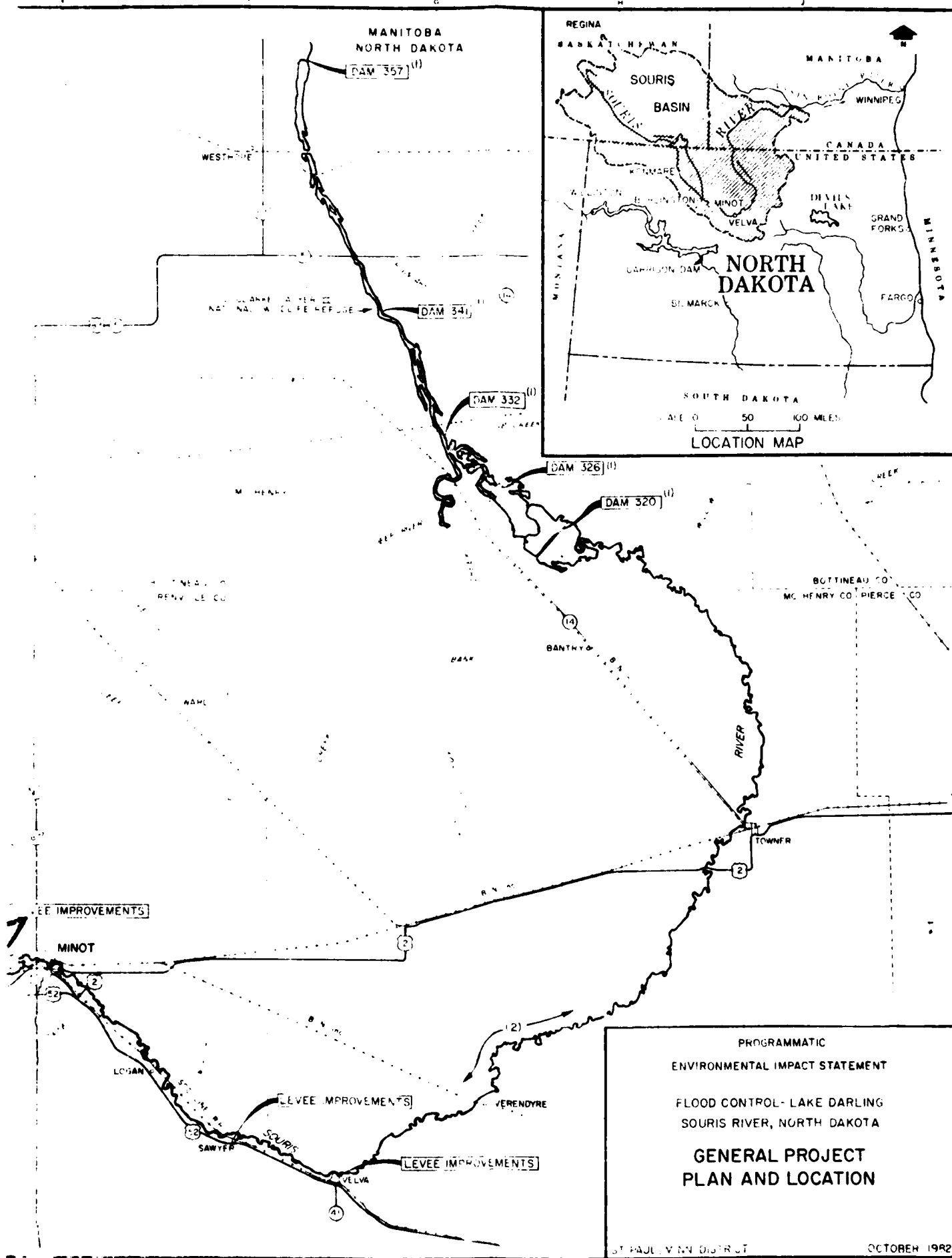


EXHIBIT 1

FISH AND WILDLIFE  
PLANNING AID LETTER





## United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE—NORTH DAKOTA

1500 CAPITOL AVENUE

BISMARCK, NORTH DAKOTA 58501

**AUG 24 1982**

Colonel Edward G. Rapp, District Engineer  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Re: Lake Darling Flood Control Project

Dear Colonel Rapp:

This letter provides planning aid information for Items 1 through 5 of the Scope of Work for U.S. Fish and Wildlife Service, FY 1982. Our purpose is to assist you in preparing the phase II general design memorandum supplement and programmatic draft environmental impact statement in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661 et seq.).

The following numbered items correspond to the same numbers in the Scope of Work:

1. A generalized description of current fish and wildlife conditions for the Souris Valley is presented. The United States portion of the Souris Basin, 9,320 square miles, includes all or portions of Renville, Bottineau, Rolette, Pierce, McHenry, Ward, Mountrail, Burke and Divide Counties. The principal features of concern to this study are the main stem of the Souris River and its immediate adjacent habitats. They include the cover types of riverine wetland, natural and impounded flood-plain (palustrine) wetland, bottomland hardwood, grassland and cultivated land.

Two major National Wildlife Refuges (NWR) were established during the extreme drouth of the 1930's on the main stem of the Souris River. The Lower Souris Refuge (now J. Clark Salyer Refuge), about 59,000 acres, was a marsh restoration project of areas drained for agricultural production. A series of five dams was erected to create pools along the 50 miles of river included within the refuge boundary. The Upper Souris Refuge of 32,000 acres encompasses nearly 30 miles of the valley. The Lake Darling impoundment covered about 20 miles of the river. Its primary purpose was to furnish a regulated supply of water to smaller marsh impoundments downstream and to the lower Souris marshes 50 miles to the east. The lake was designed to hold a 2-year supply of water in case of extended drouth. Both of these refuges have developed into major migration areas for migratory waterfowl and also important producers of ducks and Canada geese. A large diversity of wildlife species utilize the upland and lowland habitats of both refuges. An important sport fishery for walleye, yellow perch and northern pike developed in the large impoundment.

Detailed information on species and numbers of wildlife, and the human uses thereof is available. Much of the information was assembled during the Burlington project study and will not be reiterated here. The condition of these resources has been affected in recent years by both natural changes and man-induced changes. The former include an absence of extended severe drouth periods such as occurred in the 1930's, the notable shift westward to the valley of snow goose migrations, and a reduction in use by white-fronted geese. Beneficial man-induced changes have principally involved maintenance stocking and introductions of fish and wildlife species. Included are maintenance of Lake Darling's fish populations through stocking of hatchery fish, introductions of smallmouth bass, wood ducks, turkeys, ruffed grouse and Canada geese, and stocking of ring-necked pheasants. Refuge land management changes include vegetation management, additional marsh and island construction, and manipulation of water levels.

Land-use changes on private lands, by contrast, have been largely detrimental to the habitats upon which the fish and wildlife resources depend. Recently large scale wetland drainage has occurred in the river basin. Documentation of much of the drainage was done in 1976 by refuge personnel. Channelization of the tributary Boundary Creek also occurred, with its attendant wetland drainage. Similar drainage and channelization has taken place upstream in the Canadian portion of the Basin.

Fifty percent of the flows during the 1979 flood on the Souris were attributed to wetland drainage which had occurred in the North Dakota portion of the watershed (Malcolm, 1979). The drainage has had a severe negative impact upon water quality in the Souris, in addition to its large contribution to flooding and the tremendous loss of waterfowl and other wildlife habitat occasioned by the destruction of the wetlands. The drainage and channelization have added high silt loads from accelerated erosion, and nutrients and agricultural chemicals to the river and the marshes. Sewage releases have contributed to waterfowl disease losses from botulism at Salyer Refuge and fish kills in the river downstream from Minot. Feedlot runoff and flood control drawdowns have added to water quality problems at Lake Darling, including a partial winterkill of fish in 1978.

Anticipated future without project conditions in the watershed area include a continuation of the conversion of wetlands, grasslands and woodlands to cultivated areas. We have not estimated the future rates of such conversions for either the Canadian or U.S portion of the watershed. For the immediate area of project impact, the habitat types are primarily in public ownership and will, therefore, remain essentially the same in quantity. The quality of marsh and aquatic habitat will continue to decline. An important exception will be the expected alleviation of sewage discharges, with the construction of new treatment facilities. Large scale development of irrigation in the Basin, if it occurs, will exacerbate the water quality problem by collecting and discharging return flows to the watercourse and by installation of extensive drainage systems.

The preservation of remaining wetlands has been identified as the primary Important Resource Problem for the state. Objectives for this effort include many activities designed to counter existing economic and social pressures which foster drainage. Examples include the Small Wetlands Acquisition Program, new private and public preservation and restoration programs, and possible tax incentives.

Management plans for the two National Wildlife Refuges are designed to meet identified objectives for fish and wildlife population maintenance and production, and various human uses of these populations and habitats. Nonconflicting recreational and economic uses are accommodated where possible. Emphasis of habitat management programs is directed toward meeting the requirements of nesting and migrating waterfowl, primarily by improvement of existing terrestrial and aquatic areas. Marsh manipulations include alternate cycles of drying and flooding, excavating areas, and vegetation management through water level fluctuations, mechanical methods, burning, grazing and haying. Nesting area improvements are accomplished by island construction, erecting nesting structures and maintenance of herbaceous dense nesting cover on upland areas. Periodic burning, mowing, grazing, haying, cultivation and seeding are the tools used. Small acreages are cropped as a phase of rejuvenating grasslands, or to provide green browse and grain to alleviate waterfowl depredations in the area and provide wildlife food.

2. The expected general impacts of the project as a whole on fish and wildlife resources include direct and indirect, terrestrial and aquatic. Direct effects of the dam, levee and channel work include loss of woody and herbaceous cover from clearing and inundation, increased sedimentation during construction, and altered flow regimes during flood years. Riparian areas subject to reduced flood frequencies as a result of the project will have reduced productivity and possible induced conversion to alternate uses. The mere fact of flood control measures being installed may serve to stimulate additional wetland drainage in the watershed, particularly if no legal constraints are imposed.

The additional storage space available in Lake Darling, when used during spring runoff, can be expected to enhance reproduction of northern pike and yellow perch. Increased water volume in the lake will not materially change conditions for fish survival unless the permanent (management) pool is held at a higher level than at present. The winter season is critical for oxygen demand. In the long term, more sediments and nutrients will be trapped in the reservoir.

Floodpool inundation of terrestrial and marsh habitat will result in vegetational changes. The frequency and length of inundation will determine the rapidity of the changes and the ultimate species composition or lack of cover. Increased bank erosion on the reservoir will likely occur.

The cormorant-heron rookery at the Grano crossing may be affected with accelerated loss of nest trees from more frequent inundation.

Release rates from Lake Darling will be prolonged at a higher rate during flood events than the current condition. One effect of this would be reduced management flexibility of the Salyer marshes. Flows in excess of about 250 cfs restrict the drawdown capability. If the Lake Darling permanent pool level is increased, the water supply for downstream marshes would be augmented during extended drouth periods. Instream water quality would also benefit from this.

The significance of the various impacts will be determined during detailed planning. It is presently believed that aquatic impacts (river and lake) are relatively minor in scope and some may be off-setting. The impact to management of downstream marshes and increased flooding above the dam are susceptible to amelioration by implementation of appropriate measures on the refuges.

3. Determining the area and extent of flooding impact will require analysis of operation plans and hydrographs for a range of flood events. Cover types to be inundated were previously mapped at 10-foot contour intervals. These data could be refined if more detailed topography is made available. Interpolation between the contours will be done in the absence of such maps. If required, an abbreviated habitat evaluation for a very few of the major species may be conducted.

Determining impacts from construction of the dam and spillway will require site-specific location and cover types of all areas to be disturbed by construction. This includes borrow sites, excess material disposal sites, work staging areas, site limits of the dam and spillway, roads and any other related facilities. It should be identified if channel work is required immediately downstream of the new facilities.

The location and extent of breakout points along Upper Souris Refuge boundary, relocations of boundary and internal fences, roads and other facilities, and the type of land interests to be acquired will need to be determined.

Information needs for facilities at downstream housing areas other than Velva, at crossings to be upgraded, and at the Renville County Park will be the same as described above for the dam and spillway.

To determine effects on water management of the Salyer marshes, hydrological information sufficient to compare the with and without project conditions on timing and quantity of flows will be required.

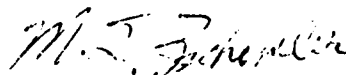
4. The proposed project basically increases the storage capacity of the largest upstream refuge impoundment by about 32 percent. This could complement the objective of water supply for downstream marshes if the normal operating level is increased. However, prolonged high flows for flood storage evacuation will hinder marsh level management, especially drawdown capability.

The fishery reproduction for northern pike and perch in Lake Darling may be improved. Winter fish survival will be enhanced only if more storage occurs at that season. Refuge objectives at Upper Souris for the identified species and groups of wildlife species should not be greatly affected. No irreversible loss of opportunity has been identified. Two potentially unmanageable conflicts are: (1) if acquisition of breakout points around Upper Souris Refuge is by a method which does not permit relocation of refuge facilities or allow necessary management; and (2) if the project operations restrict marsh management activities below Lake Darling on either or both refuges without any corrective action being taken.

5. Project plans received include a generalized discussion in the fact sheet, a preliminary conceptual design, hydrographs and discharge/frequency curves, and two preliminary levee and diversion plans. Completion of this item for suggested modifications will best be accomplished with ongoing coordination. We request the opportunity to review and comment on all planned physical developments, acquisition, siting decisions and operating plans. Some potential modifications include upgrading and possibly increasing storage, discharge capacities and winter discharge capability of Upper Souris and/or J. Clark Salter structures. Development of one or more additional marsh units on Upper Souris below Lake Darling would benefit the project area fish and wildlife resources. Improvement of nesting areas for waterfowl and colonial nesting birds may be considered. An increase in the Upper Souris management pool level should be evaluated.

We trust this information will be helpful. Any questions or additional requests should be directed to Stan Zschomler (FTS:783-4481) or Vic Hall (FTS: 783-4492).

Sincerely,



M. S. Zschomler  
Field Supervisor-Environment

EXHIBIT 2

LETTERS OF COMMENT  
AND  
CORPS RESPONSES

The responses in this section address only the comments on the Lake Darling programmatic EIS, even though some individual comment letters may refer to the Velva site-specific EIS. Responses to comments on the Velva site-specific EIS are in the comment/response section of that document. A number of comment letters appear in both this EIS and the Velva EIS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII  
1860 LINCOLN STREET  
DENVER, COLORADO 80295-0699

Ref: 3PM-EA

Col. Edward G. Rapp, District Engineer  
U.S. Army Corps of Engineers, St. Paul District  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We have reviewed the St. Paul District's Draft Programmatic Environmental Impact Statement (EIS) for the Lake Darlin Flood Control Project and the EIS for the Velva Flood Control Feature of the project. Our comments address both EIS's as well as the Preliminary Section 404(b)(1) Evaluation for the Velva project.

We continue to support the Corps' overall approach to the EPA analysis of Souris River flood protection measures -- namely, preparation of a programmatic EIS on the overall plan followed by preparation of EIS's on the site specific features of the flood control program under the tiering provisions of CEQ regulations. The comments attached to this letter identify areas in which we believe the EIS's could be strengthened.

We are especially pleased with the progress that has been made in mitigating the impacts of this plan and encourage you to continue in this direction. In view of the negative water quality impacts of wetlands drainage and estimates indicating that up to fifty percent of the flows during the 1979 flood on the Souris were attributed to wetlands drainage, we believe measures aimed at reducing wetlands drainage or restoring drained wetlands would complement the site specific mitigation measures included in the proposed flood control plan.

Based on EPA's procedures for rating EIS's, we have rated the draft programmatic EIS ER-2. This rating reflects our environmental reservations concerning the water quality impacts of raising Lake Darling and operating it for flood control purposes. The rating also reflects our conclusion that improvements are needed in the analysis and disclosure of impacts in the EIS. We will look forward to seeing these issues addressed more thoroughly in the final EIS and the site specific EIS for the Lake Darling project. We have assigned a rating of LO-2 to the draft EIS on the Velva portion of the flood control program. This rating reflects our lack of objections to the work proposed for Velva and our suggestions for improving the EIS's description of the proposal. Please contact Mr. John M. Brink of my staff (FIS 327-4831) if you have any questions about our review of these documents.

Sincerely yours,

*Steven J. Durham*  
Steven J. Durham  
Regional Administrator

Attachment

Corps Responses to the U.S. Environmental Protection Agency

1. We agree that wetland drainage has negative water quality impacts. The U.S. Fish and Wildlife Service planning aid letter (exhibit 1) incorrectly quoted from Malcoim's 1979 study, "The relationship of wetland drainage to flooding and water quality problems and its impacts on the J. Clark Salver National Wildlife Refuge." Malcoim stated that one-third, not 50 percent, of the 1979 Souris River flood flows could be attributed to wetland drainage in North Dakota.

The Corps has no authority to require reduction of wetland drainage or restoration of drained wetlands on private lands as a requirement for implementation of the proposed flood control plan, although we encourage wetland protection and restoration to reduce habitat losses, adverse water quality impacts, and losses to flood storage capacity.



#### DETAILED COMMENTS

##### Draft Programmatic EIS

We believe the overview or programmatic EIS should place the components of the plan in the perspective of the flooding problems of the area and the environmental and economic costs of solving them. We realize that many specific aspects of the Lake Darling portion of the plan will be addressed in the site specific EIS to be prepared subsequent to the programmatic review. However, the draft programmatic EIS should address questions concerning the overall level of flood protection that is expected from the program, what additional or alternative measures might be required if further reductions in flood damages are needed as well as an indication of who will be responsible for implementing them. We feel the EIS should also provide a better understanding of the expected feasibility of the individual projects and the program as a whole. The draft programmatic EIS and the scoping activities the Corps has already undertaken have helped to identify many of the essential questions to be addressed in the site specific analysis. The final EIS can address the general issues and identify specific issues that will be dealt with in greater detail in the site specific EIS.

Thus, we feel the principal areas of the draft programmatic EIS needing improvement are its description of the contributions of the various components of the plan to reductions in flood damages, possible alternatives to the proposed plan, and an overview of the financial aspects of the projects (including an overview of the costs, benefits, and distribution of costs among the various local communities served by the program). We believe that these aspects of the overall plan are ripe for disclosure, public discussion, and decision at the present stage of program planning.

##### Velva Site Specific EIS

We believe the EIS on the Velva portion of the flood control program would be improved by a more complete discussion of its relationship to the overall flood control program, and more descriptive information on the alternatives that were eliminated from detailed study during the planning process. Although indirect impacts of the levees on development in the protected floodplain are well analyzed in the EIS, the indirect effects of the project on higher upstream flood stages should be described in more detail. Indirect effects of the project on the hydrologic regimes of the wetlands and floodplain forests that will remain behind the levees should also be addressed.

Corps Responses to the U.S. Environmental Protection Agency (cont..)

2. We have modified appropriate sections of the final programmatic EIS so that it discusses the overall level of protection provided by the project; possible alternatives for increased flood protection; economic questions of costs, benefits, cost distribution, and incremental feasibility of individual features; and the historical background of some of the major project-related decisions.

-2-

We are pleased with the proposed mitigation plans for wetlands and floodplains. We encourage your agency to continue your pursuit of these measures through the implementation stages of the project. We also encourage you to consider further measures aimed at preventing drainage of wetlands and restoring previously drained wetlands as additional mitigation where they are appropriate. The relationship between wetlands drainage, degraded water quality, and increases in flooding is too strong to be considered anything less than a cornerstone of efforts to reduce flood damages in the Souris River drainage.

Preliminary Section 404 (b)(1) Evaluation

The sections of the evaluation that address Effects on Special Aquatic Sites and Determination of Secondary Effects on Aquatic Ecosystems (Sections E(5) and H, respectively) do not address the effects of the project will have on wetlands cut off from the river by the levees. We believe these impacts should be considered.

In the Executive Order 11990 evaluation on page 46, three mitigation measures that were considered and rejected are identified. We believe the document should include a brief explanation of the reasons these measures were considered impractical.



## United States Department of the Interior

OFFICE OF THE SECRETARY  
OFFICE OF ENVIRONMENTAL PROJECT REVIEW

Room 688, Building 67  
Denver Federal Center  
Denver, Colorado 80225

IN REPLY  
NOTE THE

ER 82/1803

DEC 9 2 1982

Colonel Edward G. Rapp  
District Engineer  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We have reviewed the Draft Environmental Statement for Lake Darling Flood Control Project, Renville, Ward, McHenry, and Bottineau Counties, North Dakota, and have the following comments.

### Draft Programmatic Environmental Impact Statement (EIS)

#### Fish and Wildlife Resources

1 Paragraph 3.08 - A levee to protect the cemetery would likely be located partly or wholly on National Wildlife Refuge (NWR) lands. The levee would require some removal of woody vegetation and may involve some wetland filling.

2 Paragraph 3.09, No. 4 - The option of levee protection and construction of a channel cutoff also would require use of NWR lands. The possibility of a land exchange with Renville County, or other types of land interest arrangements will be explored if this option is chosen.

3 Paragraph 3.10 - In connection with protection of the Eckert Ranch, consideration should be given to rerouting drainage from this area, or undertaking other measures to reduce the feedlot runoff problem into the lake at this location. Such pollution abatement could be an important measure to offset project-induced water quality problems in Lake Darling and the Souris River.

4 Paragraph 3.15 - Potential modifications of the J. Clark Salyer water control facilities may include raising the embankments to increase pool storage capacities. Such increased storage may be a necessary component of compensation for reduced water management capabilities caused by prolonged high flows from the project.

5 Paragraph 4.09 - The water quality discussion in this paragraph does not reflect that the largest point source, the Minot Sewage Treatment Plant, has been one of the last to upgrade facilities. Sewage discharges from this source have been a continuing problem. The large extent of wetland drainage and channelization in the basin also offsets advances made to date in municipal waste treatment.

Corps Responses to the U.S. Department of the Interior, Office of Environmental Project Review

1. We concur. The land area required for a levee to protect the cemetery would be relatively small. Wildlife habitat losses would be quantified for this feature and included among the habitat losses requiring mitigation. The loss to the refuge of real estate needed for this feature will be compensated through a land exchange with the county or through some other negotiated settlement.

2. We concur. Discussions of a possible land exchange between the affected parties have already taken place. This exchange or other arrangements will continue to be explored.

3. An alternative to acquisition of the lands and improvements at the Eckert Ranch is a levee around the buildings plus a diversion channel for bluff drainage. Measures to reduce feedlot runoff could be incorporated into the levee design and will be evaluated.

4. We concur.

5. Paragraph 4.09 of the final EIS now includes this information. We agree that continued wetland drainage and channelization in the basin offset advances made by waste treatment facilities.

6 Paragraph 4.14 - The downstream reaches of the Souris River are subject to periodic winterkill, because of low flows and water quality problems. Fish from Lake Darling constitute the principal source for repopulating downstream reaches following these events.

#### 7 Historical Resources

7 Page 18 - It is stated that acquisition of the Eckert Ranch could have an adverse effect on the Parker Log House, which is potentially eligible for the National Register of Historic Places. We were unable to locate the Eckert Ranch from the information provided in the draft statement, and would like to see a map or other information provided in the final statement which would pinpoint the location of the Eckert Ranch and the Parker Log House.

8 The final statement also should clarify the extent of the impacts which can be expected from work to be done at Fish and Wildlife Dam No. 41, and Pools A and B below Lake Darling Dam, and the raising of the Soo Line Railroad and Highway 28 bridges. It appears from the information provided, that some impacts on archeological sites can be expected, but the nature of those impacts is not discussed. Appropriate mitigation measures for historical sites also should be discussed in the final statement, and evidence presented showing the concurrence to those mitigation measures by the State Historic Preservation Officer.

#### 9 Agricultural Resources

9 Paragraph 4.20 and 5.19 - It should be stated in these two sections whether the agricultural lands are considered prime farmlands by the Department of Agriculture.

#### 10 Mineral Resources

Known mineral resources in the pertinent counties are petroleum, natural gas, coal, sand and gravel, clays, peat, and sulfur. Sand, gravel, and clay would be used in the proposed project construction.

The area around Lake Darling is a wildlife refuge that has existing mineral development restrictions. Because of those conditions, we anticipate no significant additional conflict with mineral resources.

#### • Draft Feature (EIS) Velva Flood Control Project

#### Fish and Wildlife Resources

Paragraph 5.13 - Whooping cranes were not listed because their normal migration path lies west of the basin. However, two whooping cranes were sighted in 1982 on J. Clark Salyer Refuge. Therefore, this species may occasionally migrate through the Velva area.

Paragraph 6.06 - In the last sentence, change "eastern" to "western."

Corps Responses to the U.S. Department of the Interior, Office of Environmental Review (Cont.)

6. We concur. See paragraph 4.14 of the final EIS.

7. The location of Eckert Ranch is now indicated on plate 1. The Parker Log House is part of the ranch complex.

8. Detailed information about the extent of impacts on cultural resources from dam 41, pools A and B below Lake Darling Dam, and the raising of the Soo Line railroad tracks and Highway 28 bridges will be presented in the Lake Darling site-specific EIS rather than in this programmatic EIS. Project mitigation measures and appropriate coordination with the State Historic Preservation Officer and the Advisory Council on Historic Preservation will be presented in a feature design memorandum on cultural resources.

9. We concur. See revised paragraphs 4.20-4.21 and 5.20-5.21 of the final EIS.

10. We concur. See revised paragraph 5.43 of the final EIS.

Page 34 - The fourth paragraph discusses impediments to fish movement due to current velocities through the culverts. We anticipate that downstream fish movements could occur whenever the culverts are open. Elevations of the culverts should be set sufficiently low to permit fish movement under low to no-flow conditions.

Page 46, Measures to Minimize Impact - The rock weir to be constructed in the high-flow channel should be sited downstream of the oxbow wetland, and close to the lower junction with the Velva Park loop. Properly designed and located, this weir would create a wetland in the high-flow channel, in addition to maintaining wetland values of the 5-acre remainder of the oxbow.

Page 49 - Corps Response to FMS Recommendation No. 5 - In the last sentence, it states that in order to plant more than 9 acres, additional land would have to be purchased. Additional land may become available at project sites other than Velva. We recommend that if there are any additional project lands, they be evaluated for suitability of establishing woody plantings to complete the balance of the recommended acreage.

#### Summary Comments

We concur with the content of the EIS and the 404(b)(1) evaluation. Coordination with the Fish and Wildlife Service should be continued during implementation of the Velva project to increase the amount of woody revegetation, wetland development and fish passage improvement.

#### Historical Resources

##### Draft Feature Environmental Impact Statement Comments

We are concerned that there is no apparent commitment to replace the rodeo arena. On page 1 a comment is made about "adequate rodeo facilities" being constructed at a nearby site to replace the present facility, but we found no evidence to suggest that an agreement has been reached with the city for such a replacement, or that adequate funding is available to undertake it. This is especially important in view of the statement on page 13 that the arena would probably be relocated at local expense. The final statement should include further discussion of replacement plans for the rodeo arena, including the concurrence of the city of Velva in any plan calling for local financing of its replacement.

It appears that there will be some conversion of land use at the Velva Natural Area. The Velva Natural Area has received matching assistance from the Land and Water Conservation Fund (LWCF), making it subject to the provisions of Section 6(f) of the LWCF Act, as amended. This section of the Act requires that changes from outdoor recreation use be approved by the Secretary of the Interior, and requires the substitution of other properties of at least equal fair market value and reasonably equivalent usefulness and location for the recreation lands to be taken. This would include any encroachment within the existing park boundaries by the project. Any request for a change in land use at this site must be made through the North Dakota State Liaison Officer, who is responsible for administering the LWCF in North Dakota. He is Dr. Douglas Eiken, Director, North Dakota Department of Parks and Recreation, Pinehurst Office Park, 1424 West Century Avenue, P.O. Box 700, Bismarck, North Dakota 58502.

We appreciate the opportunity to provide comments and recommendations on the Draft Environmental Statement.

Sincerely,

Handwritten signature of Robert F. Stewart in cursive script.

Robert F. Stewart  
Regional Environmental Officer

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

FEDERAL BUILDING  
P O BOX 7668  
MISSOULA, MONTANA 59807

3520

DEC 27 1982



Edward G. Rapp, Colonel  
ATTN: NCSPD-ER  
Department of the Army  
Corps of Engineers, St. Paul District  
1135 U.S. Post Office and Customs House  
St. Paul, MN 55101

Dear Colonel Rapp:

The following are comments on the Draft Programmatic Environmental Impact Statement for the Lake Darling and Velva Flood Control Projects in North Dakota.

Lake Darling Project

1. As stated on page 9, forests along the Souris River in North Dakota represent about 2 percent of the State's total forest. While the acreage is not large compared to crop and pasture land, forest land is, in many cases, the vital link in the survival of a number of wildlife species. Therefore, from a wildlife standpoint, any reduction in native forest land along the Souris River and tributaries will be detrimental to wildlife.

2. By increasing the size of the conservation and flood pools, existing forest land will be inundated all or parts of each year. Year-round or frequent inundation will kill most tree species. Periodic inundation will eliminate some of the existing tree species, thereby reducing the forest land species diversity and degrading the general wildlife habitat.

3. Increased downstream flood protection, as a result of the modifications of Lake Darling, will hasten the clearing of native forest land for additional crop and pasture land. This will further deteriorate the wildlife habitat associated with forest land.

4. Water quality in the lake would, most likely, deteriorate resulting from increased sediments from lakeshore erosion. Wave activity would probably increase corresponding to the increase in the size of the lake.

5. We recommend that any native forest land losses be mitigated on a 2:1 basis (two multi-row acres planted for every native forested acre lost).

Velva Flood Control Project

1. The selected plan is acceptable.

Corps Responses to the U.S. Forest Service

1. We concur.

2. We concur. We are assessing the degree of potential inundation and destruction of forest and other vegetative cover types in the flood pool.

3. An evaluation of aerial photographs and topographic delineation of various flood discharge outlines indicates that the level of increased protection downstream is generally insufficient to warrant widespread and/or significant clearing of forest lands to develop agricultural lands. Some small blocks in isolated areas could have a potential for clearing, but the landowners would have to weigh the pros and cons of clearing additional land that still could be inundated by floods greater than 25- to 35-year events. This situation would tend to reduce incentives for clearing more land. Very few economic benefits would accrue to agricultural lands downstream, and in some cases flooding would worsen.

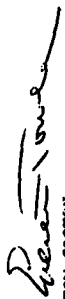
4. We concur. The degree of water quality deterioration depends on the plan of operation and other factors currently being evaluated. The Lake Darling site-specific EIS will include a more detailed analysis of impacts in the lake. A multi-level intake structure would allow withdrawal at various levels, a procedure that should improve water quality downstream.

5. Mitigation needs will be addressed in the site-specific Lake Darling EIS. We will consider your recommended level of plantings for forest land mitigation during development of the mitigation plan.

Edward G. Rapp, Colonel

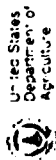
2

2. There will be a direct loss of 14 acres of native forest land under the selected plan. We believe this should be mitigated at a rate of two planted multi-row acres for every acre of native forest land lost by the project (similar to U.S. Fish and Wildlife Service and North Dakota Game and Fish Department recommendations). As stated on page 49, the C.O.E. estimates that only five acres are available for revegetation. Therefore, we recommend additional lands be acquired for mitigation of these forest land losses up to 28 acres and planted to a variety of tree species.



TOM COSTON  
for Regional Forester





United States  
Department of  
Agriculture

Soil  
Conservation  
Service

P. O. Box 1458  
Bismarck, ND  
58502

December 8, 1982

--

Corps Responses to the U.S. Soil Conservation Service.

1. We concur. Impacts on prime farmlands will be addressed to the extent that detailed soil survey maps are available by county.
2. The correction is in the final programmatic EIS.

Colonel Edward G. Rapp  
District Engineer  
Corps of Engineers/St. Paul District  
Department of the Army  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

File Code: 190-15-13-5

Dear Colonel Rapp:

The Soil Conservation Service has reviewed the Draft Programmatic Environmental Impact Statement (EIS) for the Lake Darling Flood Control Project and the Draft Feature Environmental Impact Statement for Velva Flood Control Project and Lake Darling Flood Control Project. We have the following comments:

Draft Programmatic EIS:

1. As stated on Page 10, Paragraph 4.21; Page 17, Paragraph 5.21; and Page 23, Paragraph 7.09; quantification and effects of potential impacts on prime farmlands will need to be assessed definitively in the site--specifically Lake Darling EIS.

2. Page 19, Paragraph 5.33, Line 6 -- "diciuous" should be spelled "deciduous".

2-11

Draft Feature EIS:

1. Prime farmland appears to be adequately addressed in this draft.

We appreciate the opportunity to comment.

Sincerely,

*W. Michael McHenry*  
W. Michael McHenry  
State Conservationist

cc: Peter C. Myers, Chief, SCS, Washington, D.C.

U.S. Soil Conservation Service  
Bismarck, ND

Environmental  
1425 Central  
Denver, Colorado 80202

Corps Responses to the U.S. Department of Housing and Urban Development

1. The Lake Darling site-specific EIS will discuss the anticipated workforce housing needs. The site-specific EIS will also provide a detailed description of all existing and proposed recreation sites that could be affected by the project, including both a physical description of on-site impacts as well as estimated effects on existing recreation use patterns.

November 23, 1982

Colonel Edward G. Rapp  
District Engineer  
Department of the Army  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

Thank you for the opportunity to review and comment on the draft Programmatic Environmental Impact Statement (EIS) for the Lake Darling Flood Control Project, Souris River; Renville, Ward, McHenry, and Bottineau Counties, North Dakota.

Your statement has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). The review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Within these parameters we find this document adequate for our purposes.

Since you are also in the process of preparing a site specific Lake Darling EIS it would be helpful if that document addressed the housing needs of the projected workforce. This site specific EIS should also describe the amount of park and open space land which could be lost and the subsequent impacts the loss could have on the surrounding communities.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer, at (303) 837-3102.

Sincerely,

Robert J. Matuschek  
Director  
Office of Regional Community  
Planning and Development, 8C

Corps Responses to the U.S. Department of Health and Human Services

1. The North Dakota State Intergovernmental Clearinghouse referred the draft Lake Darling programmatic EIS and Velva site-specific EIS to the North Dakota Department of Human Services. We received no comments from the Department of Human Services.

RECEIVED  
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
DIVISION OF PUBLIC AFFAIRS  
WASHINGTON, D.C. 20492  
NOV 10 1992

December 6, 1992

Colonel Edward G. Rapp  
District Engineer  
St. Paul District Corps of Engineers  
1135 U. S. Post Office and Custom House  
St. Paul, Minnesota 55101

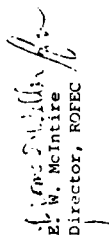
Dear Colonel Rapp:

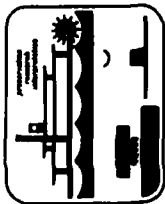
We have reviewed the first two portions of the environmental documentation for the Lake Darling and Velva Flood Control Project in North Dakota.

The DEIS states that public facilities and services, as well as other environmental factors, would not be significantly impacted by this proposed flood control project. We agree with this conclusion with respect to availability of existing social services in the affected area.

1. It is suggested, however, that the North Dakota Department of Human Services be added to the list of State agencies from which comments are solicited.

Sincerely yours,

  
E. W. McIntire  
Director, ROFEC



State Historical Society  
of North Dakota (State Historical Board)  
North Dakota Heritage Center, Bismarck, N.D. 58505  
Telephone 701-224-2666

January 13, 1983

Col. Edward G. Rapp  
District Engineer  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

Re: Draft Programmatic EIS, Lake Darling Flood Control Project and  
Draft Feature EIS, Velva Flood Control Project. (SHP0 File:  
82-11(8)2.3)

Dear Colonel Rapp:

Thank you for sending a copy of the documents referenced above to this office for review and comment.

Draft Programmatic EIS, Lake Darling

In essence, we agree that the level of cultural resource investigation conducted to date in the project area is commensurate with the current project planning phase. We are agreed that cultural resources do exist in the project area and that several significant and/or potentially significant cultural resources will be adversely affected by the project.

We are pleased to know that additional identification and evaluation studies will be completed as the planning process continues. We look forward to being apprised of the results of these studies and to completing the consultation processes.

Draft Feature EIS, Velva

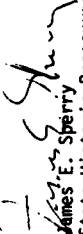
Although the statement to date appears encouraging, this office can neither agree nor disagree with the stated assumptions concerning identification, evaluation or potential impacts to cultural resources pending receipt, review and evaluation of the Velva Flood Control Cultural Resources survey report.

Colonel Rapp  
Page 2  
January 13, 1983

Again, however, we are pleased to know that this cultural resource identification and evaluation effort is in progress and that the results will be considered in subsequent planning phases.

If you have questions about these comments, please contact Mr. Walter L. Bailey (701-224-2672) at your convenience.

Sincerely,

  
James E. Sperry  
State Historic Preservation Officer  
(North Dakota)

WLB/je

Corps Responses to the North Dakota Highway Department

1. State and county roads shown to be adversely affected by the project would be modified as necessary to serve in the same manner and approximately as well as the existing facilities. Any betterment in the bridge or road modification must be a non-federal cost. Specific modification of the affected crossings would be coordinated with the appropriate State and county officials.

December 6, 1982

Colonel Edward G. Rapp  
U.S. Corps of Engineers  
Department of the Army  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

LAKE DARLING EIS - NCSPD-ER

This is in response to your letter of October 29, 1982, soliciting comments on the above referenced project. Our main concerns in general are the temporary and/or permanent disruption to the transportation system both during and after construction. Specifically, our comments about the four affected state and county crossings are the same as outlined in a letter dated March 17, 1982, from Stanley Haas to Mr. Dave Loss of your office. Further comments may be offered at a later time after the reservoir operating plan is better defined.

It is our understanding that all state and county roads affected by the raising of Lake Darling Dam would be considered as part of the Corps of Engineers project cost.

In regard to the Velva Flood Control proposal, it does not appear that any state or county roads would be impacted by this project.

Thank you for the opportunity to comment on this proposal. Please keep us informed of the progress and future plans as they are developed.

*Charles A. Gullicks*

Charles A. Gullicks, P.E.  
Program and Project Development Engineer

jmp

Corps Responses to Mr. Lloyd Huesers

1. In addition to the raise of the Lake Darling Dam, the flood control project would protect residences downstream from the reservoir. For other areas shown to have net adverse impacts from operation of the dam, the Corps would acquire an interest (flowage easement) on the property. If the golf course is shown to receive overall negative impacts from the project operations, an easement payment would be made. Such easement payments are, however, considered non-federal costs.

1900 W. 11th Drive  
Minot, ND 58701  
December 25, 1982

Mr. Kobbin Blackman  
U.S. Army Engineer District, St. Paul  
1155 U.S. Post Office & Customs House  
St. Paul, MN 55104

Dear Mr. Blackman:

A concern of mine as a citizen and a park commissioner of the city of Minot is the control of flood waters as they pass the Souris River Golf Course west of Minot, ND. Presently the golf course is not being given the security it needs; this in part is due to the policies of the U.S. Army Corps of Engineers.

I would appreciate a look at this flood problem from a historical point of view. Originally the Souris River Golf Course was a successful nine hole, 36 par course. Within a few years it became apparent that a eighteen hole facility would best serve our needs. To construct such a recreation area required more money than was available and as was the custom in the sixties, the park district applied for matching funds. These matching funds required the services of a golf course architect. The architect was hired, he did his work and his plans were approved by the federal government. The course was constructed.

At the time this happened I was teaching geology at the local public high school to 11th and 12th graders and I had a good discussion about the value of the natural levies. I thought it unwise to remove those natural levies. I assume the professional architect and the associated engineers must have

considered the liabilities. I do not know if the Corps of Engineers were involved or not, but the Federal Agency dispersing those matchin, funds must have looked at the plans, as the Souris River is an international river, or at least they should have.

I feel on the basis of this last statement that the Federal government should at least have a moral obligation of protecting the total investment in the Souris River Golf Course.

I for one would appreciate the active involvement of the Corps of Engineers in the flood control necessary.

Sincerely,



Lloyd B. Huesers



Rev. Mr. J. B. Blackburn.

Sir:

Thank you for the draft (Hydrographic Ed. 6. - 18.10.10) of the Flood Control.

My question concerns 5.22 page 17, Lease construction to protect property in Renville County Park. The 1.12 I own are not more than 75' deep from shoreline. How will this possibly accommodate a lease? Please explain this proposal.

I've made the commitment to sell this property as soon as possible since this flood control project began. I reaffirm that commitment. I could not go there another flood even though we have raised our home above flood level. This area also has become so over crowded (since this project began) it is no longer desirable for a permanent home — or overnight camping either, in my opinion.

Please inform me as soon as possible, what action will be taken concerning a lease, so I might know what I have to sell at this time.

I thank you,  
Mrs. James Munt  
Renville Lake, Minn. 56531

#### Corps Responses to Mrs. James Munt

1. A 4-foot raise would occasionally affect Renville County Park through reservoir storage. Therefore, the Federal Government would have to acquire an interest in the property (purchase, flowage easement, floodproofing, or other measures) or the area could be protected from the reservoir by a levee. Preliminary analysis and contacts with local interests indicate that the levee alternative is the preferred solution. (A sketch of the approximate levee alignment and a channel diversion was sent to Mrs. Munt.)

A weir in the diversion channel would divert water through the gate valves during normal non-flood periods so that the existing channel would have flows similar to existing conditions. A pump station would remove any accumulated water within the levee area.

Although the levee alternative is only one of the alternatives being investigated at this time, it appears to have merit. A recommendation for Renville County Park made in the June 1983 general design memorandum proposed to provide 100-year flood protection for Renville County Park with a channel cutoff and levee that ties into high ground upstream and downstream of the park area.

FINAL  
FEATURE ENVIRONMENTAL IMPACT STATEMENT  
VELVA FLOOD CONTROL  
LAKE DARLING FLOOD CONTROL PROJECT  
MCHENRY COUNTY, NORTH DAKOTA

Department of the Army  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

November 1983

FINAL  
FEATURE ENVIRONMENTAL IMPACT STATEMENT  
VELVA FLOOD CONTROL  
LAKE DARLING FLOOD CONTROL PROJECT  
MCHENRY COUNTY, NORTH DAKOTA

The responsible lead agency is the U.S. Army Engineer District, St. Paul. The responsible cooperating agency is the U. S. Fish and Wildlife Service.

Abstract: Velva is on the Souris River in central North Dakota. Flood damage reduction plans for Velva are part of the proposed Lake Darling flood control project. Six levee alignments were given detailed consideration. All of these alignments were designed to provide 100-year protection when combined with project features at Lake Darling. The recommended levee alignment was chosen because it maximizes net economic benefits and is the least environmentally damaging. Features of the recommended alignment include construction of a levee around the city of Velva, construction of a 1,600-foot cutoff channel near Velva Park, modification of 4,300 linear feet of river channel, and riprapping 6,500 feet of channel. Impacts associated with this alignment include net losses of 3.5 acres of floodplain vegetation, alteration of 14.5 acres of river channel habitat, filling or excavating 4 acres of oxbow wetland, and relocation of one residence and the rodeo arena in Velva Park.

If you want further information on this project, please contact:

Mr. Robbin Blackman  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101  
Commercial telephone: (612) 725-7746  
FTS telephone: 725-7746

Send your comments to the District Engineer within 30 days of the notice in the Federal Register.

NOTE: Information presented in the accompanying Lake Darling programmatic EIS is incorporated by reference in this EIS.

## TABLE OF CONTENTS

| <u>Section</u>  | <u>Page</u> |
|---|-------------|
| 1.00 SUMMARY  | 1           |
| Major Conclusions and Findings  | 1           |
| Areas of Controversy  | 1           |
| Unresolved Issues   | 2           |
| Relationship to Environmental Protection Statutes and<br>Other Environmental Requirements | 3           |
| 2.00 SCOPE OF THE FEATURE EIS IN RELATION TO OTHER STUDY DOCUMENTS                        | 3           |
| Relationship of Velva Features to the Lake Darling Project                                | 3           |
| Study Documents   | 3           |
| Project Schedule  | 3           |
| Criteria Used in Impact Analysis  | 4           |
| 3.00 NEED FOR AND OBJECTIVES OF ACTION  | 4           |
| Study Authority   | 4           |
| Public Concerns   | 4           |
| Planning Objectives   | 5           |
| 4.00 ALTERNATIVES   | 5           |
| Alignments Eliminated From Detailed Study   | 5           |
| Without-Project Conditions  | 6           |
| Alignments Given Detailed Consideration   | 7           |
| Recommended Alignment   | 8           |
| Least Environmentally Damaging Alignment  | 9           |
| Impact-Reducing Measures  | 9           |
| Comparative Impacts of Alternatives   | 11          |
| 5.00 AFFECTED ENVIRONMENT   | 11          |
| Environmental Conditions  | 11          |
| Significant Resources   | 12          |
| 6.00 ENVIRONMENTAL EFFECTS  | 16          |
| 7.00 PUBLIC INVOLVEMENT   | 23          |
| Public Involvement Program  | 23          |
| Required Coordination   | 24          |
| EIS Distribution  | 25          |
| Public Views and Responses  | 25          |
| LIST OF PREPARERS   | 26          |
| REFERENCES  | 28          |
| TABLES  | 29          |
| INDEX   | 33          |

TABLE OF CONTENTS (CONT.)

|                              |    |
|------------------------------|----|
| SECTION 404(b)(1) EVALUATION | 35 |
| PLATES                       |    |
| EXHIBITS                     |    |

LIST OF TABLES

| <u>No.</u>  | <u>Page</u> |
|---|-------------|
| 1 Relationship of Plans to Environmental Requirements                                 | 29          |
| 2 Cost and Implementation Responsibilities of Alignments Given Detailed Consideration | 30          |
| 3 Comparative Impacts of Alternatives   | 31          |

LIST OF PLATES

| <u>No.</u>                     |
|--------------------------------|
| 1 General Project Location     |
| 2 Alternative Levee Alignments |
| 3 Proposed Levee Alignment     |

LIST OF EXHIBITS

| <u>No.</u>                                     |
|--|
| 1 Study Authorization                          |
| 2 Analysis of Executive Orders 11988 and 11990 |
| 3 Fish and Wildlife Coordination Act Report    |
| 4 EIS Distribution                             |
| 5 Letters of Comment and Corps Responses       |

## 1.00 SUMMARY

### Major Conclusions and Findings

1.01 Six levee alignments were given detailed consideration for the Velva flood damage reduction plans. After thorough economic, environmental, and engineering review, alignment ACFGHIKM (see plate 2) was recommended as the plan that best fulfills the planning objectives. The recommended plan (in conjunction with project features at Lake Darling) is designed to protect against the 100-year flood (14,700 cubic feet per second (ft<sup>3</sup>/s). The recommended plan has a benefit to cost (b/c) ratio of 1.08. At this level of protection, the recommended plan maximizes net benefits and is the national economic development (NED) plan.

1.02 The draft EIS noted several impact-reducing modifications that were being studied. Recent availability of detailed project plans enabled evaluation and adoption of some of these measures. The adopted modifications make the recommended plan the least environmentally damaging of all the plans studied.

1.03 The recommended plan complies with Executive Order (EO) 11990 because no practical alternative would have less impact on wetlands. It is also in compliance with Executive Order 11988 because no other alternative would induce less floodplain development than the recommended alignment and associated measures (see paragraph 4.23). Impacts on prime and unique farmland have been assessed as required by the 1976 Council on Environmental Quality memorandum. A 404(b)(1) evaluation is attached to this EIS for submission to Congress in accordance with the provisions of Section 404(r) of the Clean Water Act of 1977.

### Areas of Controversy

1.04 Public concern has been expressed over the project's effects on the rodeo arena and the softball field in Velva Park. Under current plans, the softball field would still be usable; however, the rodeo arena would have to be removed. If the project is approved, the city intends to construct replacement rodeo facilities adjacent to the park.

1.05 Public concern has also been expressed over the project's effect on upstream and downstream flooding. The project would raise upstream flood stages, but the raise would be less than 1 foot for a 100-year flood. This raise is within the limit allowed by Federal flood insurance regulations. The proposed project should have no observable effects on downstream flood stages.

1.06 Public review of the draft EIS revealed no further controversial issues.

## Unresolved Issues

1.07 During preparation of the draft EIS, the recommended plan was identified as not being in compliance with Executive Order 11988; however, the city was considering zoning restrictions that would make the project comply. Since then, the city has agreed to include zoning restrictions in the recommended plan, thereby preventing land use changes on agricultural or recreation areas that would be removed from the floodplain by the levee.

1.08 The timing of all the steps in the Lake Darling schedule, including the features at Velva, is very tight. One possible sequence of events would create a financial risk for the city of Velva:

|                |  |
|----------------|--|
| October 1983:  | Right-of-way drawings for Velva available, as part of approved Velva general design memorandum and final Velva environmental impact statement.   |
| Fall 1983:     | Acquisition of Velva right-of-way (estimated cost \$145,000) possible, probably by the city on behalf of the local sponsor. Acquisition during this time would allow construction to begin as scheduled. |
| February 1984: | Negotiations begin for a contract between the local sponsor and the Federal Government for the recommended improvements at Velva.  |
| November 1984: | Scheduled construction start date for Velva.   |
| May 1985:      | Lake Darling site-specific final environmental impact statement approved, allowing contract between the local sponsor and the Federal Government for the Lake Darling raise.                             |

The risk in this schedule is that the city of Velva would acquire property, so that it can meet the November 1984 Velva construction start date, without the protection of a contract with the Federal Government for the Lake Darling raise. (Such a raise is necessary to provide Velva with the 100-year protection that it expects the project to provide.) Given the political realities of water resource funding, the city of Velva cannot be sure that Lake Darling will be raised until the second contract is signed.

1.09 Further coordination is necessary for a few issues, including coordination with the U.S. Fish and Wildlife Service about the assessment of project impacts on endangered or threatened species, coordination with the State Historic Preservation Officer and the National Park Service about the significance of cultural resources found during the survey of the project area, and coordination with the National Park Service about replacement of lands under Section 6(f) of the Land and Water Conservation Fund Act. Preliminary contact with these agencies indicated that they expect no problems or other issues to arise from their review and action on these issues. Final determinations on these issues will be presented in a supplemental information

report (SIR) that will be filed with the Environmental Protection Agency (EPA) before construction begins.

#### Relationship to Environmental Protection Statutes and Other Environmental Requirements

1.10 Table 1 describes the relationship between applicable environmental regulations and all alternatives given detailed consideration.

### 2.00 SCOPE OF THE FEATURE EIS IN RELATION TO OTHER STUDY DOCUMENTS

#### Relationship of Velva Features to the Lake Darling Project

2.01 The purpose of the Lake Darling flood control project is to reduce flood damages throughout the Souris River basin. The project includes a 4-foot raise of the Lake Darling Dam and downstream flood protection measures. Because the project features at Velva represent the single largest portion of the downstream protection measures, these are given separate detailed consideration in this feature environmental impact statement (EIS). Separate consideration of features in a large-scale project is authorized under the tiering concept described in the 1978 Council on Environmental Quality Regulations (40 CFR 1502.20).

#### Study Documents

2.02 Use of the tiering concept on the Lake Darling project involves the following environmental documents:

a. A programmatic EIS that covers general effects of the entire flood damage reduction program for the United States portion of the basin. (The final programmatic EIS is bound together with this EIS.)

b. This feature EIS on the specific effects of flood damage reduction proposals at Velva, North Dakota.

c. Another feature (or site-specific) EIS that covers specific effects of the project features at Lake Darling and some of the upstream and downstream areas.

2.03 Pertinent engineering documents (that cover the details of project planning and engineering) include the general design memorandum for the entire Lake Darling project (completed in June 1983) and the design memorandum for the Velva features (completed in November 1982).

#### Project Schedule

2.04 Construction of the Velva portion of the Lake Darling project is scheduled to begin in late 1984. The Velva features are expected to be completed in late 1986. Construction on the remainder of the project is scheduled to begin in mid-1986 and to be completed in late 1989.



### Criteria Used in Impact Analysis

2.05 The environmental analysis of the flood protection measures at Velva used the following criteria to establish boundaries between impacts associated with the Velva features and those associated with other project features:

a. Impacts of the Velva features are determined using a comparison of future conditions with and without project features at Velva and the assumption that all other features of the Lake Darling project are in place.

b. Like the impact analysis, the economic analysis determines benefits based on a comparison of future with and without project conditions and the assumption that all other features of the Lake Darling project are in place.

### 3.00 NEED FOR AND OBJECTIVES OF ACTION

#### Study Authority

3.01 Flood protection at Velva was first investigated as part of flood damage reduction studies for the entire Souris River basin. The basin study identified upgrading existing temporary levees at Velva in conjunction with other basin-wide features such as the flood reduction plan for the city. Flood protection for Velva was also studied separately under Section 205 of the 1948 Flood Control Act, as amended, although that study did not progress beyond preliminary stages. Current study authorization came in the fiscal year 1982 Energy and Water Development Appropriations Act (see exhibit 1). Velva is being studied under this authority as part of the downstream flood protection measures. (See paragraph 2.01 of the Lake Darling programmatic EIS for further information.)

#### Public Concerns

3.02 Reduction of flood damages at Velva is a major concern of most city residents and the city commissioners. Average annual flood damages at Velva are estimated at \$397,000.\* The Souris River basin has recently experienced a series of severe floods, which have prompted basin-wide studies of the causes and possible solutions (see section 2.00 of the programmatic EIS). Recent increases in flood damages in the basin and at Velva have been attributed to many factors, including changes in upstream land use (wetland drainage, etc.), the effects of upstream flood reduction projects, and recent increases in precipitation. These potential causes of flooding problems were considered in developing appropriate solutions. Additional concerns have been directed at the specific impacts of flood control projects. These included preserving prime farmland, wetlands, and areas of floodplain forest, and preserving recreation, social, and cultural resources in the study area.

\* This figure is the estimated average annual damages at Velva under existing conditions without project features at Lake Darling.

### Planning Objectives

3.03 The following general planning objectives were employed during plan formulation:

a. Reduce damages in the city of Velva, North Dakota, from floods on the Souris River during the 1986-2086 period of analysis.

b. Preserve prime and unique farmland around Velva, North Dakota, for agricultural purposes during the 1986-2086 period of analysis.

c. Preserve floodplain values, including fish and wildlife, social, and cultural values, in order to maintain ecosystem stability and aesthetic quality during the 1986-2086 period of analysis.

d. Preserve for Velva residents the recreational opportunities offered in the Velva Park area during the 1986-2086 period of analysis.

### 4.00 ALTERNATIVES

4.01 Flood damage reduction measures at Velva have been studied both separately under Section 205 of the 1948 Flood Control Act and as features in basin-wide studies such as the earlier Burlington Dam study and the current study. The Section 205 study was very preliminary (reconnaissance stage) and proposed the following alternative solutions: floodplain evacuation, combinations of flood proofing and floodplain regulation, and levee construction. Basin-wide studies have always considered only levee alternatives for flood damage reduction at Velva, with the exception of a preliminary analysis of diversion channel construction.

4.02 Most of the alternatives described in paragraph 4.01 are not discussed in this EIS for two reasons: (1) the results of preliminary analyses of these alternatives indicated that levees would provide the best form of flood protection for the city of Velva; (2) the current study authorization implied that the plan formulation accomplished under the Burlington Dam study (which recommended levees for Velva) was adequate. Consequently, the plans discussed in this site-specific EIS are the alternative levee alignments analyzed during selection of a recommended alignment for this study. This section of the EIS discusses the 15 alternative levee alignments under three headings: alignments eliminated from detailed study, without-project conditions, and alignments given detailed consideration.

#### Alignments Eliminated From Detailed Study

4.03 Of the 15 levee alignments studied, nine were not given detailed consideration. These nine alignments represent the possible combinations among three different upstream alternatives and three different downstream alternatives. These alignments are listed below and shown on plate 2 (letters represent points on plate 2):

BDEGHIKM  
BDEGHIJLM  
BDEGHJLM

ACDEGHIKM  
ACDEGHIJLM  
ACDEGHJLM

BDEFGHIKM  
BDEFGHIJLM  
BDEFGHJLM

4.04 These nine alternatives were eliminated because of the adverse economic and environmental impacts associated with reach BD and reach EG. Any alternative that includes construction of a levee from point B to point D would require raising both Highway 52 and the railroad. The cost of these raises would be very high, making alternatives with alignment BD impractical compared to cheaper alignments such as AC.

4.05 Alignment EG was first studied during the Burlington Dam study (design level of 8,000 ft<sup>3</sup>/s) and was found to be more costly than other alignments (e.g., alignment FG). Increasing the design level to the current level of 14,700 ft<sup>3</sup>/s would substantially increase the amount of channel excavation, thereby causing significant adverse environmental impacts (home relocations, loss of additional parkland, and loss of fish and wildlife habitat). Increases in the channel excavation would also substantially increase costs, which would increase the cost difference between alignments EG and FG. These combined factors resulted in the elimination of alternatives containing levees along alignment EG.

#### Without-Project Conditions

4.06 The following description of future conditions in the project area is based on an examination of community growth patterns in the region, regional demand for housing and agricultural land, sewage treatment needs, clearing rates, and wetland drainage rates.

4.07 Flooding - Flooding problems at Velva could worsen in the future if wetland drainage continues and if upstream communities build levees or channelize the river for flood protection.

4.08 Aquatic Ecosystem - The aquatic ecosystem is expected to deteriorate slowly in the future as a result of increased water demand, poorer water quality, and clearing of vegetation in the floodplain.

4.09 Water Quality - The water quality of the Souris River is also expected to deteriorate in the future. More intensive use of the river and more intensive agricultural practices (including irrigation and use of stronger fertilizers) would be the primary contributors to this deterioration.

4.10 Terrestrial Ecosystem - The clearing of natural vegetation is expected to continue. For the State of North Dakota, the rate of forest land loss was 0.35 percent per year from 1954 to 1980 (Hackett, 1982). Since Velva is an urban area where much of the easily-cleared land has already been cleared, this analysis assumes a lower annual loss rate of 0.1 percent.

4.11 Development in the Floodplain - Development in the floodplain is expected to be minimal because Velva currently has ordinances restricting such

development. The cost of complying with the ordinance (i.e., providing flood protection for new development) is the major factor in deterring floodplain development (see Executive Order 11988 analysis, exhibit 2).

4.12 Prime Farmland - Prime farmlands are expected to remain undeveloped for the same reasons that the floodplain would not be developed. Future clearing of vegetation may actually increase the amount of prime farmland in production.

4.13 Social Setting - Velva will continue to function as a secondary agricultural service center, a bedroom community for Minot (a place where many people live who work in Minot), and a retirement center for the region's farm population. Population and housing needs will depend heavily on regional economic conditions. Community cohesion will remain high, reflecting the area's cultural homogeneity and interdependence.

4.14 Cultural Resources - No significant archeological resources are presently known in the vicinity of Velva. Any buildings or structures in Velva that may have historical or architectural significance would continue to deteriorate if flooding continues. However, protection from flooding may cause a tendency to replace older structures with newer ones. Replacement of historic structures may be discouraged if the community knows about and takes advantage of Federal tax incentives for rehabilitation of historic structures.

#### Alignments Given Detailed Consideration

4.15 Six levee alignments received detailed consideration. These alignments represent the possible combinations among two upstream alternatives and 3 downstream alternatives. These six alternatives are shown on plate 2 and are summarized as follows (letters represent points on plate 2):

|           |             |
|-----------|-------------|
| ACFGHIKM  | ACDEFGHIKM  |
| ACFGHIJLM | ACDEFGHIJLM |
| ACFGHJLM  | ACDEFGHJLM  |

4.16 All alternatives studied in detail were designed to provide 100-year protection in conjunction with project features at Lake Darling. The discharge at this level of protection is 14,700 ft<sup>3</sup>/s (approximately the level that maximizes net economic benefits) and is felt to be appropriate protection for Velva. Without the upstream protection provided by the Lake Darling features, the Velva features would protect against the 70-year flood. The Lake Darling features are not scheduled for completion until late 1989, which leaves almost 3 years when the completed Velva features would only provide protection against the 70-year flood.

4.17 Features common to all alignments given detailed consideration include construction of a high-flow cutoff channel through Velva Park, modifying 4,300 feet of channel, excavating 1,600 feet of an oxbox lake, and riprapping 6,500 feet of channel.

4.18 The operating plan for the cutoff channel is the same for all alignments. Most flows in excess of 170 ft<sup>3</sup>/s would follow the cutoff

channel, while most flows under 170 ft<sup>3</sup>/s would follow the existing channel. During floods, all flows would follow the cutoff channel, and the existing river channel around Velva Park would be used for ponding and removing water from inside the levee. The cutoff operating plan was designed so that the aquatic ecosystem in the existing channel would be maintained by allowing 120 ft<sup>3</sup>/s (60 percent of average annual flows) to pass through the existing channel before the cutoff channel was used. The cutoff operating plan and its effect on discharge are explained in greater detail in the Section 404(b)(1) evaluation.

4.19 Differences among the six alignments studied in detail are essentially the differences among the upstream alternatives and the differences among the downstream alternatives. On the upstream end, those levees that follow alignment ACF bisect an agricultural field, whereas those that follow alignment ACDEF go around the field. Alignment ACF would be less expensive to construct than alignment ACDEF.

4.20 On the downstream end, three alternative alignments address the feasibility of protecting downstream structures. These structures are enclosed within the area KIJL and are also within the city limits of Velva. The majority of the structures are storage for equipment or grain; however, the Soil Conservation Service offices and one residence are also in this area. Alignments HJLM and HIJLM both protect the structures in the area, while alignment HIKM does not. Alignment HIJLM is the most expensive of these three; HIKM is the least expensive.

4.21 Table 2 presents the cost and implementation responsibilities for each of the alignments given detailed consideration. Table 3 presents benefit and benefit/cost relationships for these alignments. The economic analysis for benefits associated with each alignment assumes that upstream protection would be provided by the raise of Lake Darling Dam, and it calculates benefits assuming that the levees at Velva would be installed after that upstream protection. The authorized interest rate for calculation of annualized cost of the project is 5.125 percent.

4.22 Recommended Alignment - The recommended levee alignment is ACFGHIKM. It calls for constructing a high-flow cutoff channel through Velva Park, modifying 4,300 feet of channel, excavating 1,600 feet of an oxbow lake, riprapping 6,500 feet of channel, raising the existing Bonnes Coulee Levee (levee immediately south of point A on plate 2), and constructing a levee around the town. Alignment ACFGHIKM was chosen because it is the least costly alternative and comes very close to maximizing net economic benefits. Major features and impacts of the recommended alignment are shown in plate 3.

4.23 As part of the recommended plan, the city would be encouraged to employ all available legal measures to limit development that might result from providing flood protection to currently undeveloped areas. Other methods that would be used to minimize impacts include avoiding construction in the watercourse during March, April, and May; locating borrow pits outside of high-value habitat areas; and using approved disposal sites and acceptable disposal methods (e.g., creating brush piles, use as firewood, or burning) for disposal of removed vegetation.

4.24 Least Environmentally-Damaging (LED) Plan - In the draft EIS, levee alignment ACDEFGHIKM was selected as the LED plan because it has little potential for inducing development. After publication of the draft EIS, the city of Velva agreed to include zoning restrictions in the recommended plan. These restrictions would limit development of currently undeveloped areas and thereby would preserve land in agricultural or recreational use. Because the recommended alignment includes these zoning measures, it is environmentally equivalent to alignment ACDEFGHIKM (the LED alignment in the draft EIS), and it can therefore be considered the LED alignment.

#### Impact-Reducing Measures

4.25 The draft EIS listed several modifications to the recommended plan that were being studied to reduce the impact of the project. The availability of more detailed design work on the project and discussions with the city of Velva have enabled decisions to be made on these modifications, and have resulted in the following proposals for reduction of project impacts.

4.26 Zoning to Prevent Induced Development - The city of Velva agreed to include zoning restrictions as part of the recommended plan that would prevent land use changes on crop or recreation land protected by the levees (see exhibit 2).

4.27 Vegetation Plantings to Replace Lost Wildlife Habitat - The U.S. Fish and Wildlife Service recommended 28 acres of plantings to replace project-induced vegetation losses (see exhibit 3). The U.S. Departments of Agriculture and the Interior gave further support for these recommendations (see their comments and the Corps responses in exhibit 5). Partly in response to these comments and partly because of the availability of detailed project drawings, a detailed analysis of the project area for identification of additional mitigation lands has been conducted.

4.28 The first step in the mitigation analysis was determination of losses through a comparison of future with- and without-project conditions. Future without-project conditions were calculated using existing acres of vegetation and a clearing rate of 0.1 percent per year. Future with-project conditions were calculated using existing acres of vegetation, a clearing rate of 0.1 percent per year, 15 acres of vegetation lost because of project construction, and 10 acres of trees planted and protected because of project construction. The following summary displays the acreages and the calculation of net vegetation losses expected to result from the project.

---

Future Without Project

| <u>Existing Project Losses</u> | <u>Acres Lost to Clearing</u> <sup>(1)</sup> | <u>Total Losses</u> |
|--------------------------------|--|---------------------|
| 20 acres Not applicable        | 2.0  | 2.0                 |

Future With Project

| <u>Existing Project Losses</u> | <u>Acres Lost to Clearing</u> <sup>(1)</sup> | <u>Acres Planted</u> <sup>(2)</sup> | <u>Total Losses</u> |
|--------------------------------|--|-------------------------------------|---------------------|
| 20 acres                       | 15 acres (20-15) x 0.1 = 0.5                 | 10                                  | 5.5                 |

Net losses due to project: 5.5-2.0 = 3.5 acres

---

(1) A clearing rate of 0.1 percent per year or 10 percent over 100 years is assumed.

(2) Acres to be planted would include fill areas required for project construction and cropland areas that would be purchased for the project. More acreage may be available as purchase of project lands begins.

---

4.29 This analysis shows that net losses attributable to the project would be approximately 3.5 acres. This analysis does not consider the quality of the habitat. To analyze habitat quality, procedures such as the Habitat Evaluation Procedures (HEP) should be used. However, the team of biologists working on the project decided that the vegetation losses were not sufficiently significant to justify the effort associated with the HEP analysis. A descriptive (e.g., non-quantitative) analysis of habitat quality is in paragraph 5.11.

4.30 The Corps of Engineers has decided that the net vegetation losses of 3.5 acres would not be significant, would not result in significant impacts on the terrestrial ecosystem (see paragraphs 6.03-6.09), and therefore would not require specific mitigation measures. This decision considers the small amount of vegetation lost, the "patchy" nature of the losses (see paragraphs 6.03-6.09), and the moderate quality of the habitat that would be lost. Although no specific mitigation measures are part of the project, the opportunities for planting replacement vegetation will be explored as is usually done as part of project design for erosion control and beautification. The net loss of 3.5 acres will most likely be replaced through these types of routine plantings on uneconomic remnants or at sites of similar wildlife value associated with the overall Lake Darling project.

4.31 Mitigation of Impacts Covered Under the Land and Water Conservation (LAWCON) Fund Act (P.L. 88-578, 16 USC, 4601) - A conflict related to Section 6(f) of this law would center on Velva Park, involving the conversion of park property partially developed with the use of LAWCON funds. Required mitigation measures include substitution of additional lands not now owned by the city that have a fair market value at least equal to the affected park lands

and that have reasonably equivalent usefulness and location. Coordination procedures necessary for these transfers are discussed in paragraph 7.05.d. of this EIS.

4.32 Modification Proposed but not to Be Implemented - The following two modifications proposed in the draft EIS will not be implemented:

a. Improving River Channel Habitat Value Between Points G and H (Plate 2) - Designing habitat improvement should focus on planting vegetation along channel banks to provide cover, shade, and organic material for the channel. However, vegetation plantings on the channel banks are unacceptable because they would drastically lower the flood control benefits of the channel, possibly resulting in levee failure. The draft EIS proposed random placement of large rocks in the channel bottom to increase substrate diversity. This proposal will not be implemented because the riprap design already offers some substrate diversity, and placement of large rocks in this type of channel (flows below 0.5 feet per second, depths greater than 4 feet) would have only minor habitat benefits (Shields, 1982).

b. Augmentation of Flow to Wetlands - Augmentation of flow to the oxbow lake containing the cutoff channel was proposed in the draft EIS. Completion of detailed design and further study has determined that the head differential in this area is not sufficient to push additional water into this wetland.

4.33 Other Impact Reduction Measures - The Fish and Wildlife Coordination Act report (exhibit 3) includes eight recommendations to prevent, mitigate, and/or compensate for adverse effects on fish and wildlife resources. These recommendations are included in the mitigation measures already discussed and have been adopted wherever possible. Exhibit 3 contains the specific Corps responses to each of these recommended mitigation measures.

#### Comparative Impacts of Alternatives

4.34 Table 3 compares the effects of all alternative levee alignments that were given detailed consideration.

### 5.00 AFFECTED ENVIRONMENT

5.01 The following description of the environmental resources focuses on the city of Velva. A more detailed description of resources in the Souris River basin is in section 4.00 of the Lake Darling programmatic EIS.

#### Environmental Conditions

5.02 The city of Velva is in central North Dakota, 22 miles southeast of Minot (plate 1). Velva lies in the Souris River Valley, which is approximately three-quarters of a mile wide and is bordered by hills approximately 80 feet high. The city occupies the entire valley bottom in the project area, with the exception of the river channel, which runs along the north edge of town between residences and the north side of the valley (see plate 2).



5.03 Velva is a small city (1980 population of 1,101) that has remained viable despite a 17-percent population decline in the past two decades. It is the largest city in McHenry County and serves as a "bedroom community" for Minot (a place where many people live who work in Minot). Besides those employed in Minot, many residents work in the electric plant, sunflower processing plant, and basic care facility, which have diversified Velva's economic role from its original function as an agricultural service center to the area. The city has obtained Federal and regional planning and financial assistance for development projects, maintaining its position as a good place to live. Its sheltered location makes it especially attractive to farmers who wish to retire from the windy plains around it. The basic care facility, senior citizen center, and apartments recently built for seniors capitalize on this natural advantage.

5.04 Recreation facilities in the city include a 19-acre natural area, a city park, and a community swimming pool. Sporting facilities in Velva Park include a rodeo arena, softball and baseball diamond, all-weather track, and a football field.

5.05 Land in the Velva area can be classified as urban land, cropland, and floodplain forest land. The urban land (city of Velva) is mostly surrounded by very productive cropland, which general soil maps for the county show as prime farmland. Floodplain forest vegetation borders most of the city. This vegetation provides good habitat for many wildlife species and is especially valuable because North Dakota has very little forested land.

5.06 The Souris River in the project area is rated in the highest-valued fishery resource category. It is a low gradient/low velocity river with a mud/rock bottom, and it supports a fishery of walleye, northern pike, white sucker, longnose dace, bigmouth shiners, fathead minnows, and other species.

5.07 Recent (August 1982) cultural surveys of Velva and the recommended levee area located 26 historic structures, one archeological site, and one isolated prehistoric find.

5.08 Two types of flooding occur at Velva: high-flow spring runoff on the Souris River and flash floods from adjacent bluff runoff. Existing protection consists of temporary levees around the town and a permanent project on the Bonnes Coulee immediately upstream of Velva. The temporary levees are eroding and unstable, and they do not provide adequate flood protection. Average annual damages resulting from flooding are estimated at \$397,000. \*

#### Significant Resources

5.09 Significant resources related to the proposed project at Velva have been identified using the public interest, laws, standards, and/or technical criteria. These significant resources are briefly described in the following paragraphs.

\* This figure is the estimated annual damages at Velva under existing conditions without project features at Lake Darling.

5.10 Aquatic Ecosystem - The Souris River in the project area supports a productive aquatic ecosystem, and it is given the highest-valued fishery resource rating in the 1978 permanent stream evaluation (USFWS, 1978). Physical diversity is a key factor in maintaining a productive ecosystem, and the Souris River in the project area is physically diverse. This diversity is evident in the substrates of the river (locally variable from mud to rock), in the fish feeding and resting areas created by streamside vegetation, in the presence of oxbows and meanders which create a variety of flow conditions, and in the variability of flow conditions during the year. The aquatic ecosystem at Velva was sampled in 1975 (USFWS, 1975) and was found to contain walleye, northern pike, white sucker, longnose dace, fathead minnows, and bigmouth shiners.

5.11 Terrestrial Ecosystem - As previously stated, the predominant land types in the project area are urban land, cropland, and floodplain forest land. Urban land and cropland provide marginal habitat for most wildlife species; however, the floodplain land, with its diverse vegetation, provides excellent wildlife habitat. Predominant vegetation in the floodplain land includes American elm, burr oak, cottonwood, and green ash, with an understory of grape, sorrel, meadow rue, poison ivy, rose, and cocklebur. These species plus chokecherry and black currant grow in some of the upland areas. Valuable areas of floodplain vegetation are found along the Souris River immediately upstream and downstream of Velva. However, the vegetation along the river where it flows through town is not very extensive and has been disturbed by construction of emergency levees and other urban activities. Evidence of wildlife noted during field visits included whitetail deer and raccoon tracks, plus sightings of muskrat, marmot, waterfowl, and numerous passerine species. Other wildlife species that probably are common include cottontail rabbit, skunk, beaver, mink, squirrel, numerous small mammals, wood duck, and raptors.

5.12 State or Federally-Listed Endangered or Threatened Species - The North Dakota Natural Heritage Program reviews secondary sources (literature, museum and herbaria records) to develop and maintain location data and descriptions of all significant resources in the State. As of August 18, 1982, this source had no listing of any rare, unique, threatened, or endangered species in the vicinity of Velva.

5.13 The U.S. Fish and Wildlife Service is the agency responsible for determining which federally-listed endangered or threatened species might be found in an area. They currently list the bald eagle (threatened), the peregrine falcon (endangered) and the whooping crane (endangered) as three species that may migrate through the Velva area (see exhibit 3, the Fish and Wildlife Coordination Act Report, and exhibit 5, the comments on the DEIS).

5.14 Water Quality - Water quality problems in the Souris River basin stem primarily from sewage treatment discharges and agricultural runoff that add nutrients to the river and result in excessive algae growth, low oxygen levels in the water, and fish kills during summer or winter low-flow periods. This problem is most evident at J. Clark Salyer National Wildlife Refuge (102 river miles downstream of Velva), where winter fish kills result from nutrient-rich water. The cause has been attributed to inadequate sewage treatment at Minot

(54 river miles upstream of Velva) (USFWS, 1975) and to wetland drainage near the refuge (Malcolm, 1979).

5.15 The water of the Souris River at Velva was found to be moderately nitrogen-enriched (FWS, 1975), probably because of upstream agricultural runoff. Other water quality parameters were within State standards.

5.16 Velva Natural Area - The Velva Natural Area is a 19-acre area of floodplain forest immediately downstream of the city. This natural area has a short nature trail around its perimeter and provides excellent opportunity for environmental education. This land was donated to the city as either parkland or natural area, and to date the city has chosen to treat it as a natural area. Federal funds (Land and Water Conservation Fund) were used to develop the nature trail through this area.

5.17 Velva Park Recreation Resources - The facilities at Velva Park include a rodeo arena, softball diamond, baseball diamond, all-weather track, football field, bleachers, fences, lights, buildings, picnic grounds, and playground equipment. Federal funds from the Economic Development Administration and the Land and Water Conservation Fund were used for construction of these facilities. Velva Park is flooded an average of once every 25 years.

5.18 Prime and Unique Farmland - The Council on Environmental Quality defines prime and unique farmlands in the following manner:

"Prime farmlands are those whose value derives from their general advantages as cropland due to soil and water conditions. Unique farmlands are those whose value derives from their particular advantages for growing specialty crops." (CEQ, 1976)

General soil maps for McHenry County (N.D. Pub. Serv. Comm., n.d.) show Velva loam as the soil type that surrounds Velva. This soil type is classified by the Soil Conservation Service as prime farmland. Although detailed soil maps are not available to confirm this classification, the soil surrounding Velva is most likely prime farmland since similar soils upstream of Velva are prime farmland (SCS, 1974; Lyn DesLauries, 1983).

5.19 Floodplain Resources - Executive Order (EO) 11988 states that floodplain areas have natural, social, and economic values that should be preserved. It also states that all Federal actions should avoid adverse impacts on floodplains as long as a practical alternative exists. The city of Velva lies almost entirely within the 100-year floodplain of the Souris River. Specific values associated with the floodplain at Velva include provision of fish and wildlife habitat, recreation opportunities, and a corridor large enough to convey floodwaters downstream.

5.20 Wetland Resources - Wetlands are protected by EO 11990 in much the same way that EO 11988 protects floodplain resources. Wetlands in the project area are of the type usually associated with a slow moving, low gradient, highly meandered river (oxbow wetlands, riverine wetlands). Wetlands provide very valuable wildlife habitat and have important functions in ground-water recharge, water purification, floodwater retention, and fish spawning.

5.21 Transportation - Velva is linked with the rest of its region by U.S. Highway 52 (21 miles to Minot), State Highway 41 (12 miles to U.S. 2, which connects Minot, Devils Lake, and Grand Forks), and various county roads. The Soo Line Railroad still serves the city, and its tracks parallel U.S. 52. There is no airport. City streets are well laid out and maintained. The city park is accessible either by the Second Avenue bridge or by the park road that connects with Highway 41 north of the Souris River, skirting the city limits.

5.22 Social Cohesion - Cultural homogeneity and interdependence are high in this small rural city. Although individual attitudes and interests may differ on a particular issue, a fairly high sense of social cohesion is the normal community condition.

5.23 Institutional Arrangements - Velva is incorporated, with a city commission-president form of government. Although lacking a comprehensive plan, the city issues building permits in compliance with Federal flood insurance requirements and has a community development organization. It also works with other levels of government to achieve specific economic, social, and recreational development goals.

5.24 Cultural Resources - In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, the National Register of Historic Places has been consulted. As of 29 June 1982, no properties listed on or determined eligible for the National Register were in the Velva area.

5.25 During August 1982, a cultural resources survey was conducted in the vicinity of the proposed levee and channel work. The survey also included the Bonnes Coulee Diversion and a channel cutoff to the east of Velva near the city's water treatment ponds.

5.26 The survey located 26 structures and features, an archeological site (site 32 MH 3) and a prehistoric isolated find. The historic sites consist primarily of residences and associated outbuildings located along the proposed levee and channel work areas. The archeological site consisted of a single small flake of Knife River flint, a small piece of bone, and a piece of fire-cracked rock. The isolated find was also a small flake of Knife River flint.

5.27 Site 32 MH 3 will be tested for significance, and the test results will be coordinated with the State Historic Preservation Officer and the National Park Service. Comments received from these agencies will be presented in a supplemental information report or a supplement to the EIS before construction begins (see paragraphs 6.27-6.28).

5.28 Section 122, 1970 Rivers and Harbors Act - Section 122 of the 1970 Rivers and Harbors Act lists 17 points which should be addressed when assessing the effects of a proposed project. These categories include social, economic, and natural resource considerations such as community cohesion, transportation, employment, terrestrial habitat, and biological productivity. All 17 points were considered in this study and are addressed in this impact statement where appropriate.

## 6.00 ENVIRONMENTAL EFFECTS

6.01 This section discusses the environmental effects of each alignment that was studied in detail. This discussion of effects focuses on the significant resources presented in the preceeding section. For additional information, see the compliance and comparative impact tables (tables 1 and 3) and plate 3.

6.02 Aquatic Ecosystem - Project-induced changes in the channel configuration would be the same for all alternatives: 350 linear feet of existing stream channel would be lost through fill or straightening operations; a 2,200-foot cutoff channel would be created that, when added to the 4,300 feet of channel modifications, would produce approximately 6,500 feet of modified, partially riprapped channel; and 4,400 linear feet of channel would be restricted to maximum flows of 170 ft<sup>3</sup>/s. The following resultant changes in the aquatic ecosystem would be expected:

a. A significant reduction in the cover, shade, and organic input from streamside vegetation would result from the clearing operations.

b. The dominant aquatic species in the new channel would change to those more tolerant of higher current velocities and coarser substrates.

c. Increases in substrate diversity and corresponding increases in some populations of bottom-dwelling organisms would be caused by placement of the riprap.

d. High current velocities (greater than 3 feet per second) through culverts in and out of the old river loop around Velva Park would probably eliminate fish movement during most of the year. Fish would not be able to move upstream when river discharge is below 500 ft<sup>3</sup>/s. During an average year, flows exceed 500 ft<sup>3</sup>/s only 10 percent of the time, allowing fish to move upstream through Velva Park only 5 weeks out of the year. However, under the proposed operating plan for features at Lake Darling, prolonging flows greater than 500 ft<sup>3</sup>/s would enable unrestricted fish movement for 2 to 6 months, depending upon the amount of runoff during the year. Fish movement is usually important during spawning periods for maintenance of existing fish populations. However, restricting movement in the Velva Park area is not expected to significantly affect area fish populations because: (1) fish habitat in the area is fairly uniform; consequently, fish migration for spawning is not critical for maintaining existing populations (Ken Sambor, N.D. Game and Fish Dept., Oct. 1982); (2) spawning usually occurs during spring floods when discharge is above 500 ft<sup>3</sup>/s.

6.03 Terrestrial Ecosystem - Impacts on the terrestrial ecosystem would result from vegetation removal during channel and levee construction. Alternative alignments ACFGHJLM and ACDEFGHJLM would require removal of about 17 acres of vegetation, and the other alternative alignments would require removal of about 15 acres of vegetation. Vegetation losses would be offset by revegetation measures accomplished as part of the project. The recommended plan includes 10 acres of vegetation plantings on fill and cropland areas required for levee construction. Comparing the vegetation losses to vegetation gains with and without the project shows that the recommended alignment

would result in net losses of only 3.5 acres (see paragraphs 4.27-4.30 for determination of net losses). These losses are not significant because of their small, patchy nature.

6.04 Some minor adverse impacts on wildlife populations would be associated with the vegetation losses, but these impacts are not expected to be significant because vegetation losses are small and the vegetation to be removed is not concentrated in one area. Project features would displace some animals, thereby creating greater competition for available habitat. However, the surrounding habitat plus the new habitat created with the 10 acres of vegetation planting should absorb any displaced wildlife with only minor decreases in overall populations.

6.05 Threatened or Endangered Species - The bald eagle, peregrine falcon, and whooping crane may use the area for feeding and resting during migration. These species could stay in the area for anywhere from a few minutes to a few days and would require a source of food plus resting areas. The bald eagle and peregrine falcon require small mammals, birds, or fish for food plus trees or cliffs for roosting. Whooping cranes are omnivorous, eating a variety of foods from grains to fish. For resting, whooping cranes would probably use any areas of shallow water (mud flats or sandbars) in the project area.

6.06 The proposed project would affect feeding and resting habitat by removing 3.5 areas of vegetation and by modifying approximately 1 mile of river channel. This habitat is not of high value to these species since it is in an urban area, is disturbed, and does not have a high quality composition (excellent food supply for all three species or mud flats/sandbars for the whooping crane). The relatively low value of this habitat, the short duration of the migratory stay, and the availability of better habitat in the area were the three factors that the St. Paul District used to determine that no significant impacts on endangered/threatened species would result from the project.

6.07 This evaluation constitutes the St. Paul District's biological assessment of the effects of the Velva project features on endangered/threatened species. This endangered species evaluation will be coordinated with the Fish and Wildlife Service (FWS) as required under Section 7(c) of the Endangered Species Act, as amended (see paragraph 7.05.a). If the FWS agrees with this evaluation, this document will complete the Section 7(c) coordination requirements.

6.08 Water Quality - Channel excavation and placement of fill material are part of all the alternatives. These activities would temporarily increase Souris River turbidity levels immediately downstream of the project area. The effects of channel modification at Minot were evident 23 river miles downstream (FWS, 1975); however, the sediments at Minot were much more nutrient-rich than those at Velva, and the Minot channel project was much larger in scale. Suspended material from construction at Velva should settle out within the first few miles, thereby having only minor short-term impacts.

6.09 Velva Natural Area - All levee alignments would require removal of some vegetation and disruption of the nature trail in the Velva Natural Area.

HD-A138 295

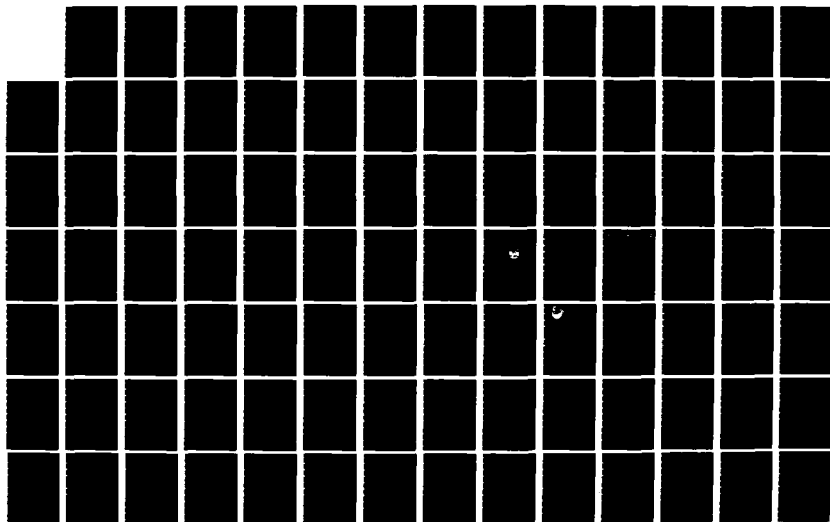
FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT LAKE  
DARLING FLOOD CONT. (U) CORPS OF ENGINEERS ST PAUL MN  
ST PAUL DISTRICT NOV 83

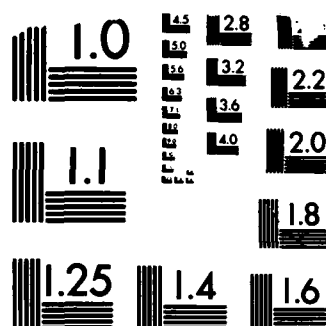
2/3

UNCLASSIFIED

F/G 13/2

NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A



Alignments ACDEFGHJLM and ACFGHJLM would require crossing the nature trail and clearing a 60-foot by 1,400-foot path (approximately 1.9 acres) in the middle of the area. All other alignments (including the recommended alignment) would disrupt 200 feet of the nature trail and require clearing a 60-foot by 450-foot path (approximately 0.6 acres) along the western edge of the area.

6.10 Because Land and Water Conservation (LAWCON) funds were used for the Velva Natural Area, a conflict related to Section 6(f) of the Land and Water Conservation Fund Act, as amended, could result from conversion of land use in this area. The city proposes to amend their LAWCON project plan for the natural area to allow a permanent easement for the levee. If the appropriate State and Federal officials approve such an amendment, the project would not cause a Section 6(f) LAWCON conflict in the natural area. If this amendment is not accepted, the Section 6(f) conflict would be resolved using the procedures described in paragraph 7.05.d. of this EIS.

6.11 Velva Park Recreation Resources - The proposed flood control measures would provide flood protection to Velva Park resources. Levee construction would require relocation of the existing rodeo arena. The city plans to relocate the arena immediately south of the existing park. The proposed levee would also eliminate through traffic in the park by dead-ending the existing park road. City park board members have indicated support for this action because it will alleviate existing traffic and parking problems.

6.12 As in the Velva Natural Area, portions of Velva Park have been developed using LAWCON funds. Consequently, a Section 6(f) LAWCON conflict would result from the proposed action. This conflict would be mitigated through substitution of additional lands of least equal fair market value and of reasonably equivalent usefulness and location. Paragraph 7.05.d. of this EIS describes the coordination and mitigation process necessary for project compliance with this law.

6.13 Prime and Unique Farmland - The various levee alignments would provide flood protection for three cropland areas: a 15.5-acre field immediately south of Velva Park, a 14.5-acre field enclosed by levees CDEFC, and a 20-acre portion of the area enclosed by levees HIJH. According to general soil maps for the county, the soil in these areas is Velva loam and the area is considered prime farmland. The specific acreage that would be protected by each alignment is shown in table 3. Housing demand in Velva is such that any cropland area protected from flooding could be developed (see exhibit 2, Executive Order 11988 analysis). However, since the selected plan already includes zoning restrictions (see paragraph 4.23), protected cropland would not be developed and would maintain its agricultural potential either as cropland or as green space.

6.14 Floodplain Resources - Construction of levees around Velva would remove the entire city and some additional acreage from the floodplain. Because the urban land provides very little floodplain value, this removal should not significantly affect floodplain resources in the region. Analysis of the pressure to develop in Velva indicates that any additional acreage removed

from the floodplain would be developed and would result in some lost floodplain values. Table 3 shows additional acres to be protected by each alternative.

6.15 The draft EIS stated that the recommended plan did not comply with EO 11988 because there were practicable alternatives which would induce less floodplain development. After publication of the draft EIS, the city of Velva agreed to include zoning restrictions in the recommended plan that would preserve land use on agricultural or recreation lands that would receive flood protection from the project. With this new condition, a comparison of future with- and without-project developments now shows that the recommended alignment would not induce any more development than any of the alternative alignments. The proposed project therefore now complies with EO 11988.

6.16 Wetland Resources - For the following discussion, wetlands are defined as oxbow lakes formed from old river meanders that are cut off from main channel flows. Project effects on other wetland types (stream channels) are presented in paragraph 6.02.

6.17 All alternatives involve some fill and/or excavation activities in wetland areas. Every alternative requires excavation of the oxbow lake near Velva Park for construction of the high-flow cutoff channel. In the cutoff channel area, 4 acres of the existing wetland vegetation would be replaced with a riprapped channel, which would provide only a fraction of the wildlife habitat now available.

6.18 All alternatives also require placement of a plug in a wetland area at the downstream end of the channel work to deflect the major portion of the flood flows down the main river channel. Culverts would be placed through the plug to allow some flow in and out of this oxbow, thereby maintaining the wetland values.

6.19 Aligning the levee across the oxbow wetland that surrounds the Velva Natural Area would isolate some of that oxbow from the replenishing characteristics of flood flows. Alignments ACFGHJLM and ACDEFGHJLM would isolate 7 acres of oxbow wetland. The other alignments (including the recommended alignment) would isolate 3 acres of the oxbow wetland. To minimize the impacts of isolation, this wetland area would be part of the interior drainage system. As part of that system, it would receive fresh water and remain wet, thereby retaining most of its current habitat value. Although the oxbow would remain valuable to most wildlife species, levee construction would not permit fish to use the isolated area. This barrier to fish use would cause a minor decrease in available fish habitat but should have no appreciable effect on the river fishery.

6.20 The impacts of the proposed project on all wetland areas as they relate to the requirements of EO 11990 are presented in exhibit 2 (Executive Order 11990 analysis).

6.21 Transportation - Any of the alignments given detailed consideration would affect Velva's transportation system as follows:

a. Railroad Avenue would be raised about 3 feet near the Soil Conservation Service Building at the east end of town. This raise would disrupt traffic for a few weeks during construction (detours or slowing) at this point.

b. The park road would dead-end near the baseball field, no longer providing access to and from Highway 41. Park traffic would have to use the Second Avenue bridge plus some combination of residential and commercial streets.

c. The two homes at the north end of Third Street West would be isolated when the new levee eliminates Glenwood Avenue, the only access to that block. The city would extend Third Street one block north by filling in the low-lying area north of Fifth Avenue, as part of the project costs and requirements.

d. Construction vehicles would use various city and township roads during the two years of construction activities. Some congestion and road surface deterioration is expected during this time. Previous road conditions would be restored by the Government contractor when work is completed.

e. Upon project completion (including completion of project features at Lake Darling), Velva's transportation system would be protected against the 1-percent flood, allowing safe movement within the city and maintaining Velva's links with important regional facilities, such as hospitals.

6.22 Social Cohesion - A normally well-integrated and cohesive social group can be disrupted by issues involving economic interests or emotional ties. Although there are no known severe threats to Velva's social cohesion, the following potentially disruptive issues should be noted. The issues affecting social cohesion fall into two categories: equity and opposition.

6.23 Equity - Government actions are frequently perceived as having effects that benefit one group at a cost to another group. The recommended plan for Velva provides flood protection for most of the city's property and citizens, yet there are several sources of possible conflict about issues of equity:

a. Upstream Groups - Flooding upstream of Velva could be increased; however, the increase would be less than 1 foot for the 100-year flood and would be of short duration. Although adverse physical impacts should not be significant, rural families may be concerned that protection for the city would adversely affect their property.

b. Downstream Groups - To save considerable project costs, a developed area at the downstream end of Railroad Avenue (see plate 2: the area defined by KI JL) would have a slightly lower degree of flood protection than the rest of the city. The property owners in this area may feel it is unfair that they are not "worth" the incremental cost of protection, insofar as they are excluded by the preferred alignment.

c. Acquisition Groups - Some properties would have to be acquired by purchase, either from willing sellers or after condemnation. One or two homes would be removed, and 50 acres would be acquired for project purposes.

Another 14 acres adjacent to the project may be acquired by the city for other purposes. Up to 30 acres of this property is presently agricultural land outside of the city limits that would require annexation prior to acquisition. Although the city must comply with Public Law 91-646 (the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), which helps offset the financial burden of displacement, there are emotional ties to homes and farmland for which compensation is not always possible. Some owners may resent their losses as an unfair sacrifice for the community's good.

d. Taxpayer Groups - Although Velva may receive financial assistance from the North Dakota State Water Commission, the method in which the balance of local costs is allocated to Velva taxpayers may cause dissatisfaction.

6.24 Opposition - The equity factors discussed above might become sources of opposition. In addition, three other areas of opposition may exist:

a. Some residents feel the selected plan is too environmentally destructive, especially in the upstream end near the park.

b. Residents regard the park as a particularly important social resource of historic and current value. They have expressed concern about removal of the rodeo arena and softball area, and over perceived disruption to the traditional patterns of activity in the park.

c. Some Velva residents may feel that their existing emergency levee provides adequate protection against present conditions. To these people, building a costly flood protection project might be seen as unnecessary, except for the Lake Darling raise.

6.25 Protection against flooding should improve Velva's economic and social viability as a secure and attractive community, thus strengthening the long-term social cohesion.

6.26 Institutional Arrangements - The proposed project would cause changes in the legal and organizational relations in Velva. Details of these changes cannot be known at this stage, but their general nature is discussed in terms of the match of the project to local plans, financial capability, and organizational relations.

a. Match with Plans - The city of Velva has no formal planning process and no comprehensive plan. However, this project is compatible with many of the goals and objectives developed by the Souris Basin Planning Council, of which Velva is a member. Flood control has long been a goal of Velva city representatives, and the proposed project seems to meet most local officials' expectations. However, some citizens prefer that the city park be left intact, and there probably will be some conflict over whether land use changes should be permitted in the land presently in agricultural or recreational use.

b. Financial Capability - Under present local plans, a joint board would be the sponsor for local cooperation requirements of the project. This joint board would have the legal authority to levy 6 mills upon properties that benefit from the project. However, it is currently unknown whether the local

cost-sharing would use the traditional formula or the Army's proposed cost-sharing policy. Approximately 300 properties in Velva would benefit from the project. Depending on the cost-sharing formula to be used and on the eventual sponsor, options for financing would have the following effects:

Possible Financing Arrangements

| Sponsor                                      | Traditional Cost-Sharing |           | Proposed (35%) Cost-Sharing |             | Joint Board,<br>Velva & Others |
|--|--------------------------|-----------|-----------------------------|-------------|--------------------------------|
|  | Joint Board              | Velva     | Joint Board                 | Velva       |                                |
| Local Costs                                  | \$212,900                | \$212,900 | \$1,335,303                 | \$1,335,303 | \$1,335,303                    |
| Legally Feasible                             | yes                      | no        | no                          | no          | *                              |
| Average Cost to<br>a Residential<br>Property | \$90/year                | --        | --                          | --          | \$90/year                      |
| Repayment Period                             | 9 years                  | --        | --                          | --          | 20 years                       |

\* Also requires \$5.7 million contribution from State or some other entity, for total Lake Darling-Velva costs.

Because Velva's limited tax base is already near its limit of bonded indebtedness, decisions about investment of this magnitude must be carefully considered through the local political process.

c. Organizational Relations - The requirements for local sponsorship of the project would impose several changes on the existing organizational structure in the region. Although no substantial legal changes need to be made, zoning ordinances for floodplain management must be passed and enforced by several government units, and regulation of drainage must be enforced. The creation of a Souris River flood control joint board to act as the single Lake Darling project sponsor would increase the existing organizational complexity considerably. Recent North Dakota legislation encourages formation of such drainage system-based districts. Such districts could promote wiser water and land use planning. However, if this joint board is created only for this project and is not fully representative of all basin interests, it would add to the number of overlapping organizations and could possibly forestall creation of a truly basin-wide water resource district. Although details about the joint board have not been decided, there would be some mechanism that allocates costs to different political units benefitting from the project. Velva, as one of the early beneficiaries, would have to establish a legal and practical method of sharing responsibilities and costs for its portion of the project. These changes in organizational relations are neither necessarily good nor bad, but they can complicate the area's normal patterns of political power and accountability.

6.27 Cultural Resources - A check of the National Register of Historic Places indicated that no significant cultural resources would be affected by the

proposed action. However, a cultural resources survey of the recommended alignment located one site (32 MH 3) of unknown significance that would be destroyed by the proposed action. Based on previous survey results, the quality and significance of this site is expected to be low; however, further testing for significance is still required. This testing is scheduled for early fall 1983. The results of this site testing will be coordinated with the National Park Service and the State Historic Preservation Officer to arrive at a determination of significance. Documentation of this coordination will be filed with EPA in a supplemental information report or a supplement to this EIS (see paragraphs 1.09 and 7.05.c.). If testing determines that this site is significant, it may be possible to make an alignment change that would avoid the site or to obtain a determination of "No Adverse Effect" from the Advisory Council on Historic Preservation based upon a data recovery effort at the site.

6.28 Because of the requirement for further testing at 32 MH 3 and the coordination of results with various agencies, the project only partially complies with the Archaeological and Historic Preservation Act of 1966. Full compliance will be achieved when the results of the cultural resources testing is coordinated with the State Historic Preservation Officer and the National Park Service.

6.29 Section 122, 1970 Rivers and Harbors Act - Section 122 of the 1970 Rivers and Harbors Act specifies these additional categories of impacts, which were considered but found to be not significant for this project: noise, displacement of people, aesthetic values, desirable community growth, public facilities and services, employment and labor force, regional growth, air quality, and water supply.

#### 7.00 PUBLIC INVOLVEMENT

7.01 The following summarizes the public involvement program used to collect public views and responses to project proposals at Velva. Much of this was accomplished in conjunction with the public involvement program for Lake Darling. Section 6.00 of the programmatic EIS contains an overview of the public involvement program.

##### Public Involvement Program

7.02 The Velva portion of the Lake Darling project was included in the notice of intent to prepare an EIS that was published in the Federal Register on 28 April 1982. Comments on the Velva features and significant resources were also solicited in scoping letters sent to all agencies and individuals concerned with the Lake Darling project. A public meeting was held in Velva on 17 August 1982 to inform the public of specific project proposals for Velva. Throughout the study, close coordination was maintained with concerned State, Federal, and local agencies plus groups and individuals.

7.03 Major issues raised through the public involvement program included protection of the recreation facilities at Velva Park; project effects on upstream flooding problems, prime farmland, and fish and wildlife habitat; and local cost-sharing responsibilities.

### Required Coordination

7.04 The draft Velva feature EIS was coordinated with various agencies, groups, and individuals. Comments received on the draft EIS were used during preparation of the final EIS, and are in exhibit 5. Paragraphs 7.07 and 7.08 summarize these comments.

7.05 This final EIS will be coordinated with the public, comments received will be addressed, and a record of decision and final EIS will be filed with EPA and submitted to Congress. The following specific coordination will be conducted:

a. Endangered Species - Coordination with the U.S. Fish and Wildlife Service (FWS) regarding revegetation measures and the biological assessment of project effects on endangered or threatened species (coordination required under Section 7(c) of the Endangered Species Act).

b. Clean Water Act - Review of the final 404(b)(1) evaluation for submission to Congress under Section 404(r) of the Clean Water Act.

c. Cultural Resources - Site 32 MH 3, located within the Velva levee alignment, will be tested for its eligibility for the National Register of Historic Places during the 1983 field season. Testing results will be coordinated with the North Dakota State Historic Preservation Officer and the National Park Service. If the site is not significant, the results of the coordination will be presented in a supplemental information report (SIR) and filed with EPA before construction begins. If the site is determined to be significant, mitigation proposals will be presented in a supplement to this EIS, which will be distributed for public review and comment.

d. Land and Water Conservation (LAWCON) Fund Act Conflicts - Conflicts related to Section 6(f) of this act, which requires mitigation measures for land-use conversions in areas developed with LAWCON funds, would be resolved according to formal procedures. The Corps of Engineers, the National Park Service, the North Dakota Parks and Recreation Department, the city of Velva, and the Velva Park Board have developed the following resolution process:

(1) The city would identify suitable replacement property of at least equal fair market value and of reasonably equivalent usefulness and location.

(2) The replacement property and the park land to be converted would be appraised at city expense. Both appraisals must be approved by the National Park Service before conversion and purchase of the substitute property. The replacement must be purchased at city expense.

The Section 6(f) conflict would be formally resolved by the National Park Service (U.S. Department of the Interior) upon agreement of all involved parties to comply with the mitigation requirements noted above. This compliance would take the form of a letter of intent initiated by the city of Velva through the North Dakota Parks and Recreation Department. The letter would identify the Section 6(f) conflict. It would also identify the

agreement to conduct all required mitigation measures before the construction of the proposed flood control project. The National Park Service resolution of the Section 6(f) conflict would be included in a Corps of Engineers supplemental information report (SIR) that would verify compliance with the Land and Water Conservation Fund Act. The Corps would distribute the SIR to the public and concerned agencies before it took any administrative action related to project construction.

#### EIS Distribution

7.06 Either a copy of this document or a notice of its availability was sent to the individuals and organizations listed in exhibit 4.

#### Public Views and Responses

7.07 During the public involvement program, many public views were expressed that had a major influence on the study and that were considered in the decision-making process. Three primary concerns were the reduction of flood damages, minimization of social impacts, and minimization of fish and wildlife impacts. These concerns and others were considered in the analysis of alternative levee alignments and in identification of a recommended plan.

7.08 Public review of the draft EIS produced several comments that led to changes in the EIS. These comments included those from the Department of the Interior and Agriculture (USDI, USDA) recommending more detailed work on mitigation of project impacts; comments from USDI and the North Dakota Department of Parks and Recreation recommending mitigation of impacts in the Velva Natural Area under Section 6(f) of the Land and Water Conservation Fund Act; a comment from the Environmental Protection Agency recommending more detailed information on the relationship between the Velva features and the overall flood control project; and a comment from USDI to add the whooping crane to the list of endangered species that might be in the project area. The St. Paul District incorporated these changes into the EIS, expanding or revising paragraphs 1.02, 2.01-2.05, 4.25-4.31, 5.13, 6.03-6.04, 6.05-6.07, 6.11-6.12, and 7.05. Comments on the draft EIS and the Corps responses to those comments are in exhibit 5.



# LIST OF PREPARERS

| <u>Name</u>         | <u>Expertise</u>           | <u>Experience</u>   | <u>Role in Preparation of EIS</u>   |
|---------------------|----------------------------|---|---|
| Mr. Dennis Anderson | Aquatic Biologist          | 4 years aquatic biologist, St. Paul District, Corps of Engineers. 3 years research assistant, St. Mary's College.   | Prepared 404(b)(1) evaluation.  |
| Mr. David Berwick   | Archaeologist              | 3 years cultural resources management and EIS studies, St. Paul District, Corps of Engineers. 2 years cultural resources management, Memphis District, Corps of Engineers.  | Reviewed and coordinated cultural resources survey. Evaluated impacts on cultural resources.    |
| Mr. Robbin Blackman | Supervisory Biologist      | 12 years EIS studies, Corps of Engineers.   | EIS coordinator.  |
| Mr. James Diedrick  | Regional Economist         | 3 years regional economics, St. Paul District, Corps of Engineers.  | Economics evaluation.   |
| Mr. Gary Erickson   | Civil Engineer             | 5 years consulting engineering firm; 17 years Corps of Engineers.   | Project engineer.   |
| Ms. Suzanne Gaines  | Sociologist                | 4 years sociologist, St. Paul District, Corps of Engineers; 1 year research assistant, Arizona State Univ., Sociology Department and Survey Research Laboratory; 3 years teaching assistant, University of Minnesota, Sociology Department. | Prepared social impact evaluations and Executive Order 11988 evaluation.                        |
| Mr. Vic Hall        | Wildlife Biologist         | 13 years wildlife biologist, U.S. Fish and Wildlife Service; 13 years wildlife/land manager, U.S. Fish and Wildlife Service.  | Prepared Fish and Wildlife Coordination Act Report; evaluation of impacts on fish and wildlife. |
| Mr. James Holleran  | Outdoor Recreation Planner | 8 years resource planning, St. Paul District, Corps of Engineers.   | Evaluation of impacts on recreation resources.  |

LIST OF PREPARERS (Continued)

| <u>Name</u>        | <u>Expertise</u> | <u>Experience</u>   | <u>Role in Preparation of EIS</u>                                     |
|--------------------|------------------|---|---|
| Mr. John Kittelson | Biologist        | 3 years biologist, St. Paul District, Corps of Engineers            | EIS coordinator and primary author; evaluation of biological impacts. |
| Mr. Dave Loss      | Civil Engineer   | 11 years project management, St. Paul District, Corps of Engineers. | Project manager.  |

## REFERENCES

- Council on Environmental Quality, 1976. Analysis of Impacts on Prime and Unique Farmland in Environmental Impact Statements. Memorandum for Heads of Agencies, Washington, D.C.
- Des Lauries, Lyn, 22 March 1983. Personal Communication. Soil Conservation Service, Bottineau, N.D.
- Fish and Wildlife Service, 1975. Limnological Survey of the Souris River and its Major Tributaries in North Dakota. Bismarck Area Office, Bismarck, N.D.
- Fish and Wildlife Service, 1978. Stream Evaluation Map, North Dakota. Office of Biological Services, Denver, CO.
- Malcolm, Jon M., 1979. The Relationship of Wetland Drainage to Flooding and Water Quality Problems and its Impacts on the J. Clark Salyer NWR. Fish and Wildlife Service, Upham, N.D.
- N.D. Public Service Commission, n.d. Energy Conversion Facility and Transmission Facility Siting Inventory Report, Bismarck, N.D.
- Shields, Douglas F., 1982. Environmental Considerations for Flood Control Channels. COE, Waterways Exp. Sta., Vicksburg, MS.
- Soil Conservation Service, 1974. Soil Survey of Ward County, North Dakota. USDA, Washington, D.C.

Table 1. Relationships of Plans to Environmental Requirements.

|   | No Action | Levee<br>ACDEFGHIKM    | Levee<br>ACDEFGHIJLM   | Levee<br>ACDEFGHJLM    | Levee<br>ACFGHIJLM     | Levee<br>ACFGHJLM      | Levee<br>ACFGHIK       |
|---|-----------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| <u>Federal Statutes</u>   |           |                        |                        |                        |                        |                        |                        |
| Archaeological and Historic Preservation Act, as amended, 16 U.S.C. 469, et seq. <sup>(2)</sup> | N/A       | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> |
| Clean Air Act, as amended, 42 U.S.C. 7401, et seq.  | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Clean Water Act, as amended (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.      | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Coastal Zone Management Act, as amended, 16 U.S.C. 1451, et seq.                                | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| Endangered Species Act of 1973, as amended, 16 U.S.C. 1531, et seq.                             | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Estuary Protection Act, 16 U.S.C. 1221, et seq.   | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1(12), et seq.                  | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.                          | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Land and Water Conservation Fund Act, as amended, 16 U.S.C. 4601-4601-11, et seq.               | Full      | Partial <sup>(4)</sup> | Partial <sup>(4)</sup> | Partial <sup>(4)</sup> | Partial <sup>(4)</sup> | Partial <sup>(4)</sup> | Partial <sup>(4)</sup> |
| Marine Protection, Research and Sanctuaries Act, 22 U.S.C. 1401, et seq.                        | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, et seq.                  | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470a, et seq. <sup>(2)</sup>  | N/A       | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> | Partial <sup>(2)</sup> |
| Rivers and Harbors Act, 33 U.S.C. 401, et seq.  | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.                          | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| Wild and Scenic Rivers Act; as amended, 16 U.S.C. 1001, et seq.                                 | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| <u>Executive Orders, Memoranda</u>  |           |                        |                        |                        |                        |                        |                        |
| Floodplain Management (EO 11988)  | Full      | Full                   | Full                   | Non <sup>(5)</sup>     | Full                   | Non <sup>(5)</sup>     | Full                   |
| Protection of Wetlands (EO 11990)   | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Environmental Effects Abroad of Major Federal Actions (EO 12114)                                | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |
| Analysis of Impacts on Prime and Unique Farmlands, CEQ Memorandum 30 August 1976                | Full      | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| State and Local Policies  | Partial   | Full                   | Full                   | Full                   | Full                   | Full                   | Full                   |
| Land Use Plans (None in City of Velva)  | N/A       | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    | N/A                    |

NOTES: The compliance categories used in this table were assigned based on the following definitions.

- Full compliance - All requirements of the statute, E.O., or other policy and related regulations have been met for the current stage of planning.
- Partial compliance - Some requirements of the statute, E.O., or other policy and related regulations remain to be met for the current stage of planning.
- Noncompliance - Violation of a requirement of the statute, E.O., or other environmental requirement.
- Not applicable (N/A) - Statute, E.O., or other policy not applicable for the current stage of planning.

- Levee ACFGHIKM is the tentatively recommended plan. Letters used to describe levee alignments correspond to points on plate 2.
- Compliance is partial because only a partial survey has been made of the levee alignment and remaining coordination requirements (see paragraphs 1.09, 6.28, and 7.05.c.).
- Compliance is partial because of remaining coordination requirements (see paragraphs 1.09, 6.28, and 7.05.c.).
- Compliance is partial because of remaining coordination requirements (see paragraphs 1.09, 6.09, 6.11, 6.12, and 7.05.d.).
- Alignment does not comply because it could induce development in the floodplain.

Table 2 . Cost and Implementation Responsibilities of Alignments Given Detailed Consideration. <sup>(1)</sup>

|                          | <u>Total Cost</u> <sup>(2)</sup> | <u>Federal Share</u> <sup>(2)</sup> | <u>Local Share</u> <sup>(2)</sup> |
|--------------------------|----------------------------------|-------------------------------------|-----------------------------------|
| Alignment<br>ACDEFGHIKM  | \$5,185,000                      | \$4,900,000                         | \$285,000                         |
| Alignment<br>ACDEFGHIJLM | \$5,365,000                      | \$5,065,000                         | \$300,000                         |
| Alignment<br>ACDEFGHJLM  | \$5,240,000                      | \$4,950,000                         | \$290,000                         |
| Alignment<br>ACFGHIJLM   | \$5,180,000                      | \$4,890,000                         | \$290,000                         |
| Alignment<br>ACFGHJLM    | \$5,054,000                      | \$4,774,000                         | \$280,000                         |
| Alignment<br>ACFGHIKM    | \$4,968,000                      | \$4,610,000                         | \$358,000                         |

(1) Costs are given at October 1982 levels.

(2) If the proposed Army cost-sharing policies apply to this project, the Federal Government would pay 65 percent of total costs and the local sponsor would pay the remaining 35 percent.

Table 3. Comparative Impacts of Alternatives

| Significant Resources  | Plans | Base condition  | Future without-<br>Project condition  | Levee alignment (1)  |   |   |   | Levee alignment (1)<br>ACFCHILN   | Levee alignment (1)<br>ACFCHILN   | Levee alignment (1)<br>ACFCHILN |
|--|-------|---|---|--|---|---|---|---|---|---------------------------------|
|  |       |   |   | ACDFCHILN  | ACDFCHILN   | ACDFCHILN   | ACDFCHILN   |   |   |                                 |
| Economic considerations<br>(x \$1000)                        |       | average annual damages = \$320  | average annual damages = \$363  | total costs = 5,185<br>net benefits = 10<br>b/c ratio = 1.03   | total costs = 5,365<br>net benefits = 0<br>b/c ratio = 1.0  | total costs = 5,240<br>net benefits = 7<br>b/c ratio = 1.02   | total costs = 5,180<br>net benefits = 10<br>b/c ratio = 1.03  | total costs = 5,054<br>net benefits = 17<br>b/c ratio = 1.06  | total costs = 4,968<br>net benefits = 24<br>b/c ratio = 1.08  |                                 |
| Aquatic ecosystem  |       | Substrate: mud and rock.<br>Flow: high spring flows are usually followed by low summer/winter flows.<br>River at Velva given "highest valued fishery resource" rating.<br>(value class 1A)  | Development pressures and trends in the basin indicate a slow deterioration of the aquatic ecosystem.   | Substrate would change to large rock and velocities would increase in a 3,400-foot reach of river channel. Flows would be restricted to approximately 160 ft <sup>3</sup> /s maximum in a 4,400-foot reach. Riprap would provide better habitat for many bottom-dwelling aquatic insects, and consequently, better fish food. The increases in food value would be offset by decreases in the cover and reproductive values of the habitat. Project features around Velva Park would prohibit fish passage during some portions of the year. |   |   |   |   |   |                                 |
| Terrestrial ecosystem  |       | Wooded river corridor provides high value habitat for many wood-land/wetland species. Woodlands are surrounded by low value cropland & residential areas. Woodlands are especially valued in N.D. because they are uncommon.                      | A clearing rate of 0.12 per year is assumed.  | 15 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 3.5 acres.  | 15 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 3.5 acres. | 17 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 5.5 acres. | 15 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 3.5 acres. | 17 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 5.5 acres. | 15 acres of floodplain vegetation would be eliminated; however revegetation measures would result in net floodplain vegetation losses of 3.5 acres. |                                 |
| State or Federally listed endangered or threatened species   |       | No State-listed species have been recorded in the Velva Area. (2) The U.S. Fish and Wildlife Service lists the bald eagle (threatened), the peregrine falcon (endangered), and the whooping crane (endangered) as migrating through the area. (3) | No change is assumed.   | No effect.   | No effect.  | No effect.  | No effect.  | No effect.  | No effect.  |                                 |
| Water quality  |       | USGS data show some nutrient enrichment but otherwise good water quality. Impoundments on the river may have low dissolved oxygen.  | A trend toward declining water quality resulting from more intensive agricultural practices may be offset by better sewage treatment measures. Therefore, no change is assumed. | Increased turbidity levels would occur during construction periods. No significant effects are anticipated.  |   |   |   |   |   |                                 |
| Velva Natural Area   |       | The Natural Area consists of 30 acres of floodplain forest surrounded by an onshore lake. The land was donated to the city. Federal funds were used to construct a nature trail around the perimeter.   | No change is assumed.   | A 60-foot by 450-foot path for the levee would be cleared along the west edge of the area.   | A 60-foot by 450-foot path for the levee would be cleared along the west edge of the area.  | A 60-foot by 1,400-foot path for the levee would be cleared through the middle of the area.   | A 60-foot by 450-foot path for the levee would be cleared along the west edge of the area.  | A 60-foot by 1,400-foot path for the levee would be cleared through the middle of the area.   | A 60-foot by 450-foot path for the levee would be cleared along the west edge of the area.  |                                 |
| Velva Park Recreation Resources                              |       | Park facilities include rodeo grounds, softball field, baseball field, football field with all-weather track, bleachers, buildings, fences, lights, etc. Land and Water Conservation funds were used to develop some of these facilities.         | Existing flooding problems are expected to continue and eventually ruin the all-weather track and damage other facilities.  | A conflict related to Section 6(f) of the Land and Water Conservation Fund Act would be resolved through amendment of the LAMCON project to provide an easement for the levee.   |   |   |   |   |   |                                 |
| Prime and Unique Farmland as specified in the CQJ regulation |       | Soil throughout the project area is the Velva Loam. Velva Loam is listed by the SCS as prime farmland.  | Floodplain regulations are expected to preserve existing prime farmland.  | Flood protection would be provided to 15.5 acres of prime farmland (Velva Loam).   | Flood protection would be provided to 15.5 acres of prime farmland (Velva Loam).  | Flood protection would be provided to 35.5 acres of prime farmland (Velva Loam).  | Flood protection would be provided to 30 acres of prime farmland (Velva Loam).  | Flood protection would be provided to 50 acres of prime farmland (Velva Loam).  | Flood protection would be provided to 30 acres of prime farmland (Velva Loam).  |                                 |

Protected farmland would not be developed because of zoning restrictions included as part of the project.

Table 3. Comparative Impacts of Alternatives (Continued)

| Significant Resources                            | Base condition   | Future without project condition   | Levee alignment (1) ACDFFHJLM  | Levee alignment (1) ACDFFHJLM  | Levee alignment (1) ACDFFHJLM  | Levee alignment (1) ACDFFHJLM  | Levee alignment (1) ACDFFHJLM  |
|--|--|--|--|--|--|--|--|
| Floodplain Resources as specified in 8011988     | The entire project area is within the 100-year floodplain.   | Lack of flood protection area are not expected and floodplain regulation are expected to preserve existing floodplain resources. | 41.5 acres of land (other than urban land) would be removed from the floodplain. 15.5 of these acres could be developed into non-floodplain uses.  | 41.5 acres of land (other than urban land) would be removed from the floodplain. 15.5 of these acres could be developed into non-floodplain uses.  | 56 acres of land (other than urban land) would be removed from the floodplain. 30 of these acres could be developed into non-floodplain uses.  | 96 acres of land (other than urban land) would be removed from the floodplain. 30 of these acres could be developed into non-floodplain uses.  | 56 acres of land (other than urban land) would be removed from the floodplain. 30 of these acres could be developed into non-floodplain uses.  |
| Wetland Resources (other than the river channel) | Oxbow wetlands (old river meanders cut off from the main river channel) are found throughout the project area.   | Wetlands in the project area are not expected to change.   | Channel excavation and levee construction would involve filling and/or excavating 4 acres of wetland.  | Channel excavation and levee construction would involve filling and/or excavating 4 acres of wetland.  | Channel excavation and levee construction would involve filling and/or excavating 4 acres of wetland.  | Channel excavation and levee construction would involve filling and/or excavating 4 acres of wetland.  | Channel excavation and levee construction would involve filling and/or excavating 4 acres of wetland.  |
| Transportation (Soo Line Railroad, city roads)   | Velva is serviced by the Soo Line Railroad and a well developed and maintained network of road transportation.   | No significant changes foreseen.   | Construction of a levee parallel to the railroad tracks between points C and D could cause excessive snow build-up on the tracks.  | Construction of a levee parallel to the railroad tracks between points C and D could cause excessive snow build-up on the tracks.  | Construction of a levee parallel to the railroad tracks between points C and D could cause excessive snow build-up on the tracks.  | Construction of a levee parallel to the railroad tracks between points C and D could cause excessive snow build-up on the tracks.  | Construction of a levee parallel to the railroad tracks between points C and D could cause excessive snow build-up on the tracks.  |
| Social Cohesion                                  | Fairly high cohesion; cultural homogeneity and interdependence.  | No significant changes foreseen.   | All levee alignments would affect transportation as follows: (1) temporary interruption of FAS 71 (Traux Ave.); (2) 2-year use of city and township roads for construction activities; (3) city traffic and links to region would be protected during floods (up to 1 percent frequency).  | All levee alignments would affect transportation as follows: (1) temporary interruption of FAS 71 (Traux Ave.); (2) 2-year use of city and township roads for construction activities; (3) city traffic and links to region would be protected during floods (up to 1 percent frequency).  | All levee alignments would affect transportation as follows: (1) temporary interruption of FAS 71 (Traux Ave.); (2) 2-year use of city and township roads for construction activities; (3) city traffic and links to region would be protected during floods (up to 1 percent frequency).  | All levee alignments would affect transportation as follows: (1) temporary interruption of FAS 71 (Traux Ave.); (2) 2-year use of city and township roads for construction activities; (3) city traffic and links to region would be protected during floods (up to 1 percent frequency).  | All levee alignments would affect transportation as follows: (1) temporary interruption of FAS 71 (Traux Ave.); (2) 2-year use of city and township roads for construction activities; (3) city traffic and links to region would be protected during floods (up to 1 percent frequency).  |
| Institutional Arrangements                       | The city works with other government levels for development, but lacks a comprehensive development plan. Velva is in compliance with Federal flood insurance requirements. It has a modest tax base.     | No significant changes foreseen.   | Threats to cohesion could arise from perceptions of inequities including: induced upstream flooding; exclusion of east area of town from protection; acquisition of one residence and agricultural acres; and allocation of local costs. Additional threats to social cohesion could result from potential opposition over environmental costs, disruption of the city park, or perceptions of the necessity of flood protection. Social cohesion could be improved by a decreased flooding frequency. | Threats to cohesion could arise from perceptions of inequities including: induced upstream flooding; exclusion of east area of town from protection; acquisition of one residence and agricultural acres; and allocation of local costs. Additional threats to social cohesion could result from potential opposition over environmental costs, disruption of the city park, or perceptions of the necessity of flood protection. Social cohesion could be improved by a decreased flooding frequency. | Threats to cohesion could arise from perceptions of inequities including: induced upstream flooding; exclusion of east area of town from protection; acquisition of one residence and agricultural acres; and allocation of local costs. Additional threats to social cohesion could result from potential opposition over environmental costs, disruption of the city park, or perceptions of the necessity of flood protection. Social cohesion could be improved by a decreased flooding frequency. | Threats to cohesion could arise from perceptions of inequities including: induced upstream flooding; exclusion of east area of town from protection; acquisition of one residence and agricultural acres; and allocation of local costs. Additional threats to social cohesion could result from potential opposition over environmental costs, disruption of the city park, or perceptions of the necessity of flood protection. Social cohesion could be improved by a decreased flooding frequency. | Threats to cohesion could arise from perceptions of inequities including: induced upstream flooding; exclusion of east area of town from protection; acquisition of one residence and agricultural acres; and allocation of local costs. Additional threats to social cohesion could result from potential opposition over environmental costs, disruption of the city park, or perceptions of the necessity of flood protection. Social cohesion could be improved by a decreased flooding frequency. |
| Cultural Resources                               | 26 historic structures, 1 archaeological site, and 1 isolated find are located within boundary of recommended plan. No National Register of Historic Places properties are located in vicinity of Velva. | Continued deterioration of historic structures as a result of flooding.  | All alignments agree with basin-wide plan. Financial capability of local sponsor is uncertain at this point. Organizational relations would probably become more complex as a result of the project.   | All alignments agree with basin-wide plan. Financial capability of local sponsor is uncertain at this point. Organizational relations would probably become more complex as a result of the project.   | All alignments agree with basin-wide plan. Financial capability of local sponsor is uncertain at this point. Organizational relations would probably become more complex as a result of the project.   | All alignments agree with basin-wide plan. Financial capability of local sponsor is uncertain at this point. Organizational relations would probably become more complex as a result of the project.   | All alignments agree with basin-wide plan. Financial capability of local sponsor is uncertain at this point. Organizational relations would probably become more complex as a result of the project.   |

(1) Letter designations of alignments represent points on plate 2.

(2) North Dakota Natural Heritage program 1982, personal communication.

(3) See exhibit 1: Fish and Wildlife Coordination Act report.

## INDEX

The following is an index to various subjects in the Velva feature EIS. This index does not cross-reference other documents since no others address the Velva features.

Abstract ....11  
Affected Environment ....11  
Alignments ....5  
    - Eliminated From Further Study ....5  
    - Given Detailed Consideration ....7  
    - Least Environmentally Damaging ....9  
    - National Economic Development ....8  
    - Recommended ....8, plate 3  
Alternatives ....5, plate 2  
Aquatic Ecosystem ....6, 13, 16, 41, Exhibit 3  
Authorization for the Study ....4, Exhibit 1  
Comments ....11, 25, Exhibit 5  
Comparative Impacts of Alternatives ....11, Table 3  
Conclusions and Findings ....1  
Controversy ....1  
Coordination ....1, 24, Exhibits 3, 4, 5,  
Cultural Resources ....15, 24, Tables 1 and 3  
Distribution of the EIS ....25, Exhibit 4  
Ecosystem ....(see Terrestrial Ecosystem, Aquatic Ecosystem)  
Endangered/Threatened Species ....13, 17, 24, 43, 44, Tables 1 and 3  
Environmental Conditions ....11, Table 3  
Environmental Effects ....16, 35, Table 3  
Executive Orders 11988, 11990, ....14, 18, Tables 1 and 3, Exhibit 2  
Farmland, Prime and Unique ....7, 14, 18, Tables 1 and 3, Exhibit 2  
Flooding Problems ....4  
Floodplain Resources ....14, 18, Table 3  
Impacts (see Environmental Effects, Comparative Impacts of Alternatives)  
Institutional Arrangements 15, 21, Table 3  
Issues, Unresolved ....2, 10, 24, Exhibit 3  
Laws and Statutes ....4, Exhibit 1  
Literature Cited ....28  
Location ....7, plate 1  
Modifications to Recommended Alternative ....9, Exhibit 3  
Need for Proposed Action ....4  
No Action ....6  
Objectives, Planning ....5  
Plans ....5  
    - Eliminated from Further Study ....5  
    - Given Detailed Consideration ....7  
    - Least Environmentally Damaging ....9  
    - National Economic Development ....8  
    - Recommended ....8, plate 3  
Preparers of the EIS ....26  
Public Concerns ....4, 25, Exhibit 5



## INDEX (cont.)

Public Involvement ....23, Exhibit 5  
Public Views and Responses ....Exhibit 5  
Review Period ....11  
Scope of the EIS ....4  
Section 122 Impact Categories ....15, 23  
Significant Resources ....12, Table 3  
Social Cohesion ....15, 20, Table 3  
Summary ....1  
Terrestrial Ecosystem ....13, 16, Table 3  
Transportation .... 15, 19, Table 3  
Velva Natural Area ....14, 17, Table 3  
Velva Park ....14, 18, Table 3  
Water Quality ....13, 17, 35, Table 3  
Wetlands ....14, 19, 43, Table 3  
Without Project Conditions ....6

SECTION 404(b)(1) EVALUATION  
FOR FILL ACTIVITY ASSOCIATED WITH  
THE FLOOD CONTROL PROJECT ON THE SOURIS  
RIVER AT VELVA, NORTH DAKOTA

I. PROJECT DESCRIPTION

A. Location: The proposed fill activity would take place along the Souris River in the immediate vicinity of Velva, North Dakota.

B. General Description: The proposed action would involve: (1) placement of clay-silt-sand fill material along the bank of the Souris River and other areas immediately surrounding the city of Velva, North Dakota, for the construction of 10,130 feet of levee; (2) placement of rock 12 to 24 inches deep along 4,300 linear feet of existing Souris River channel; (3) placement of clay-silt-sand fill and rock riprap along a proposed high water cutoff channel around Velva Park; (4) installations of culverts, to allow a maximum flow of 160 cubic feet per second in the main channel of the Souris River that will be blocked by the levee construction; (5) placement of a clay-silt-sand plug, rock riprap, and a culvert across the mouth of an old oxbow channel near the downstream end of Velva.

C. Authority and Purpose: Federal authority for the project is contained in the fiscal year 1982 Energy and Water Development Appropriations Act. The purpose of the project is to provide flood protection for the city of Velva, North Dakota.

D. General Description of Dredged or Fill Material

1. General Characteristics of Material: Field stones with a probable average diameter of 6 inches would be used for the riprap. The other fill material would be collected from within the basin and would most likely consist of two types: recent alluvium (clay, silt, fine to medium sand), and morainal deposits (impervious stoney clay till with thin seams, lenses, and channels of sand gravel).

2. Quantity of Fill Material: The fill material would consist of approximately 43,400 cubic yards of rock riprap and 156,500 cubic yards of a combination of excavated dry bank material, borrow pit material, and material from the existing levee.

3. Source of Material: The field stones for the riprap would be obtained from stockpile sites near the project area. The clay-silt-sand material would be obtained from excavation of selected dry bank areas, from part of the high water cutoff channel and straightening of the existing channel, from removal of the existing emergency levee, and from an approved borrow pit located near the project area.

#### E. Description of Proposed Discharge Site

1. Location: The fill activity would take place along a straightened section of the Souris River immediately adjacent to Velva, along a proposed high water cutoff channel, across the existing channel upstream of Velva, across the mouth of an old oxbow channel immediately downstream of Velva, and at other areas immediately upstream and downstream of Velva. Map 1 shows the areas where fill activities would occur.

2. Size: The proposed action would cover and destroy approximately 16 acres of stream bottom aquatic habitat and 4 acres of wetlands.

3. Type of Site: The fill activity would take place in a riverine setting at an unconfined site.

4. Types of Habitat: Approximately 20 acres of wetlands would be affected. Because the overall proposed plan requires much excavation and dredging of the existing channel and of the proposed high water cutoff channel, most of the fill area would be recently exposed clay-silt-sand bottom, essentially devoid of life. However, some of the fill material along the Souris channel would be placed on undisturbed stream bottom with a substrate of mud and occasional rocks. Much of the existing bank areas are steep and subject to extreme erosion.

5. Timing and Duration: If the project is approved and funds are available, construction would begin in November 1984 and be completed by November 1986.

F. Description of Disposal Method: The rock, borrow pit material, and material from the existing levee would be moved and placed by trucks, front-end loaders, tractors, and other mechanical means.

## II. FACTUAL DETERMINATIONS

### A. Physical Substrate Determinations

1. Substrate Elevation and Slope: The fill material would not change the existing gradient (approximately 0.5 feet per mile) of the Souris River. Existing steep channel banks would be flattened to a slope of 1 foot vertical for every 2.5 feet horizontal.

2. Sediment Type: The Fish and Wildlife Service (1975) indicates that the general surficial sediments in the area consist of mud and sand with occasional rocks. The material from the borrow pits, the excavated material, and the material from the existing levee are probably similar and would not cause a significant change in substrate type in areas where only this material is placed. However, most of the bank areas would be riprapped with rock. The rock would be a significant change from present clay-silt-sand substrate.

3. Dredged/Fill Material Movement: Because of the presence of fine material (silts and clays) in the fill, some movement is expected to occur along the main channel of the Souris River during construction, especially in

the areas where the channel would be straightened. However, because no construction would be done during periods of high discharge, the sand- and gravel-sized particles and most of the silts and clays would not move from the fill areas. Riprapping with rocks in high energy areas would be done shortly after the silt-clay-sand fill has been placed and would greatly reduce the potential for movement of the fill material. The riprap would also prevent long-term movement of the fill material.

## B. Water Circulation, Fluctuation, and Salinity Determinations

### 1. Water

a. Salinity: Not applicable.

b. Water Chemistry: The placement of clean fill material should not have any significant impacts on the Souris River's water chemistry.

c. Clarity: Some minor, short-term decreases in clarity in the Souris River would be expected during the fill activities because of the presence of silts and clays in the borrow material and in the existing emergency levee. However, once the riprap is in place, there should be a slight improvement in water clarity because the erosion that presently occurs would be reduced.

d. Color: The proposed fill activity should have no impact on water color.

e. Odor: The proposed fill activity should have no impact on water odor.

f. Taste: The proposed fill activity should have no appreciable impact on water taste.

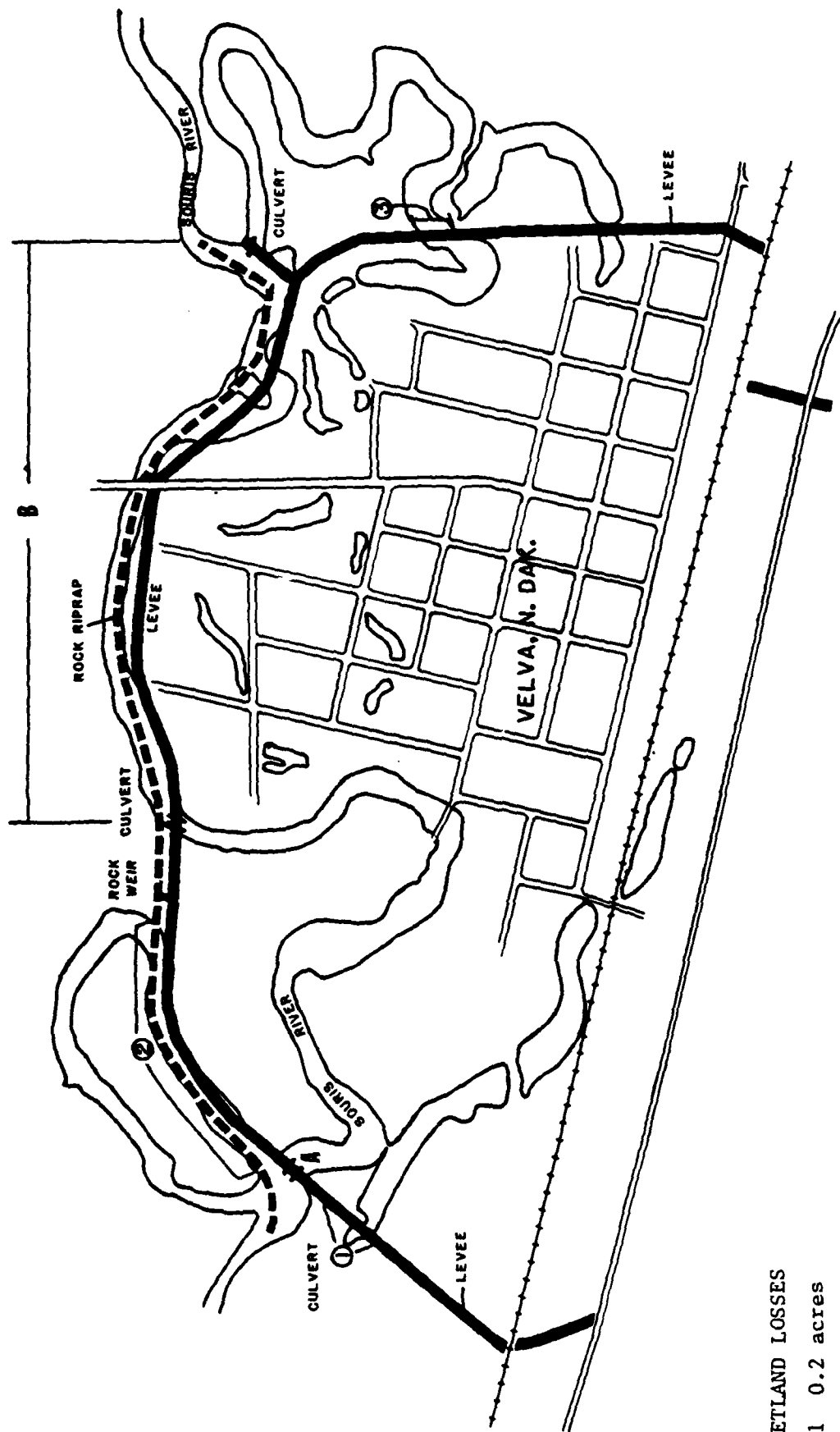
g. Dissolved Gas Levels: The proposed fill activity should have very minimal impact on dissolved gas levels. Because aerobic sediments with only small amounts of organic material would be used as fill, no impact on dissolved oxygen levels is expected.

h. Nutrients: The proposed fill activity should have no significant impact on nutrient levels in the water.

i. Eutrophication: The proposed fill activities should have no impact on the level or rate of eutrophication of the water.

### 2. Current Patterns and Circulation

a. Current Patterns and Flow: The purpose of the proposed project is to change current patterns and flow conditions in the area to provide flood protection for the city of Velva. Current patterns and flow would be altered in 2 miles of river channel by construction of the high-flow cutoff channel, riprapping the river channel, and restricting flows around Velva Park. Flow characteristics of three wetland acres near point 3 on map 1



# WETLAND LOSSES

- 1 0.2 acres
- 2 3.9 acres
- 3 0.2 acres

# STREAMBANK/BOTTOM MODIFICATION

- A 2.9 acres
- B 12.8 acres

MAP I

would change because they will be protected from flood flows by the levee. Although this wetland area would no longer be replenished by spring floods, it would not be significantly altered because it is included in the interior drainage system that would maintain its water supply.

b. Current Velocity - The proposed project would affect current velocity in the three areas described below. All other areas would experience only minor changes in current velocity.

(1) Current velocity would increase in the straightened channel area (reach B on map 1) during flood conditions. Under existing conditions, flood flows spread over the entire floodplain. The proposed project would restrict these flows to the river channel, thereby forcing more water through a confined area and increasing current velocity.

(2) The existing river channel around Velva Park would be cut off by the levee, but would be supplied with water through culverts. the water supply rate to this area compared with the total discharge rate for the Souris River is shown in figure 1. Discharge on the river is greater than 120 cubic feet per second ( $\text{ft}^3/\text{s}$ ) for about 25 percent of the year; the proposed project would lower discharge and velocities in this area for about 3 months during the year. In addition, the culverts would have to be closed because of high discharges sometime between April and June in 4 of every 5 years. At this time, a flow of only 15  $\text{ft}^3/\text{s}$  would occur in the area. (This flow would result from seepage, runoff, and a 6,800-gallon pumping station near the downstream culvert.) The culverts could be closed from only a couple of days to as many as 50 days. For 1 year in 5, the culvert probably would need to be closed for 15 days or longer. Current velocities in this area would be substantially reduced (cross-sectional current velocities of approximately 0.05 foot per second) when the culverts are closed.

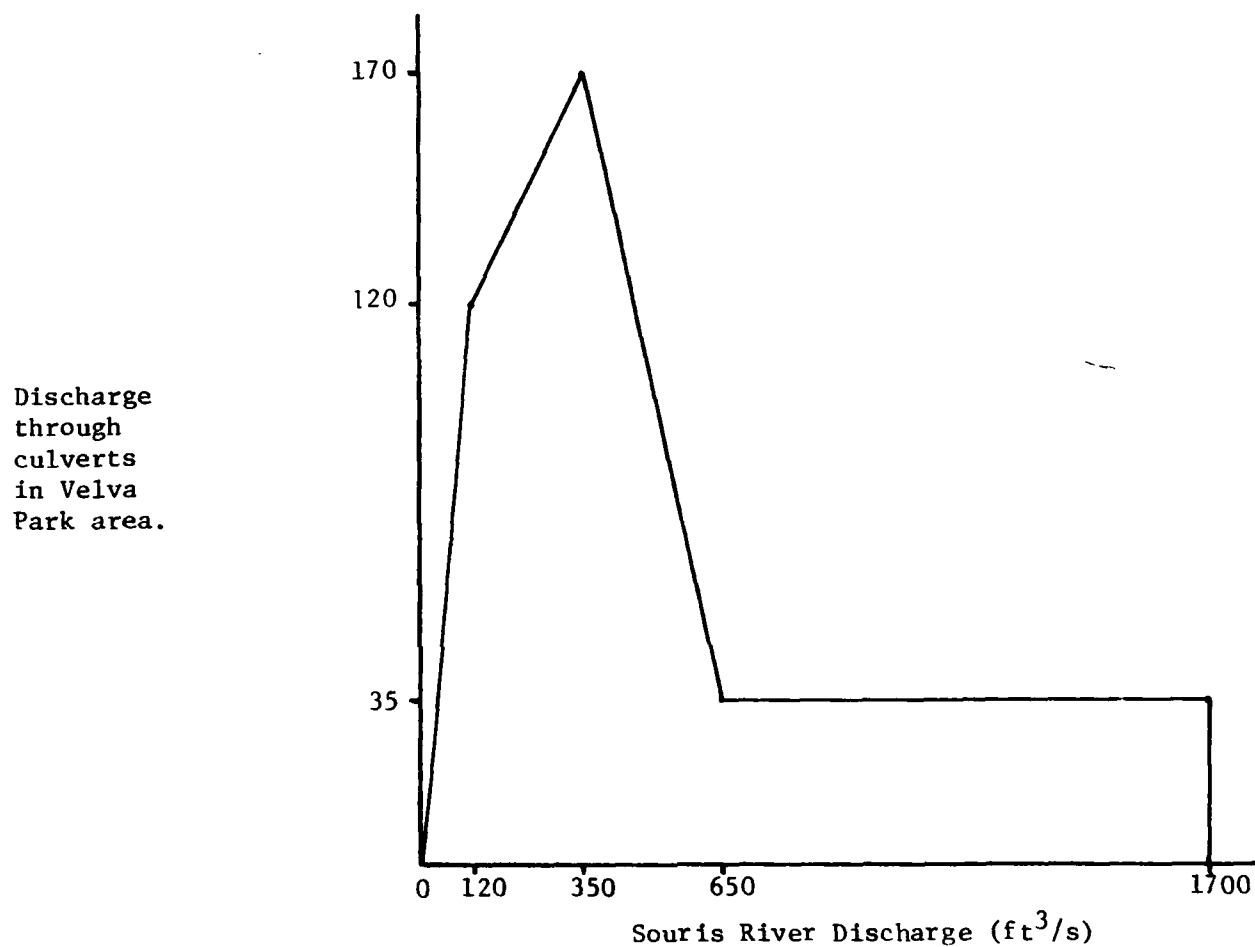
(3) Project features in the Velva Park area would affect discharge/velocity relationships to a degree that fish movement would be affected. For Souris River discharges between 500  $\text{ft}^3/\text{s}$  and 1,700  $\text{ft}^3/\text{s}$ , fish would be able to use the existing river channel around Velva Park for upstream movement. For discharges above 1,700  $\text{ft}^3/\text{s}$ , fish could move through the high flow cutoff channel north of the park. For discharges under 500  $\text{ft}^3/\text{s}$ , fish would not be able to move through the Velva Park area because current velocities in the culverts would be above 3 feet per second and because the rock wier in the high-flow cutoff channel would prevent fish passage.

c. Stratification: The proposed fill activities would have no significant impact on stratification.

d. Hydrologic Regime: The proposed fill activities would have no significant impact on the hydrologic regime.

3. Normal Water-Level Fluctuations: Because of the constriction of flood waters caused by the levee system, upstream river stages would increase. Maximum increases are expected to be less the 1 foot for the 100-year flood. The fill activity would have a negligible effect on downstream river stages.

Figure 1: Discharge rates in culverts around Velva Park compared to discharge rates in the Souris River.\*



\* Discharge rates are only approximate and represent the best estimates available at time of publication. The graph is intended to show the anticipated relationship rather than show the absolute numeric values.

4. Salinity Gradient: Not applicable.

5. Actions Taken to Minimize Impact: Culverts would be added to the proposed cutoff section of main channel and, except for during peak flows, 170 ft<sup>3</sup>/s of flow or the entire river flow (whichever is less) would be maintained to reduce impacts in this area. Mechanical means of placing the fill material would decrease the impact on water quality and fill material movement. In addition, placement of the rock riprap on the levee shortly after construction would reduce long-term impacts on water quality and on fill movement from the site.

C. Suspended Particulate/Turbidity Determinations

1. Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Fill Site: Construction activities such as excavation and dredging would elevate levels of turbidity and suspended particulates, and the fill activities would add to this problem. Some of the silts and clays in the borrow material and in the existing emergency levee would mix with river water during placement. Some erosion may occur prior to stabilization with rock riprap. This erosion would also elevate both turbidity and suspended particulate levels, but the increases are expected to be relatively minor and short-term.

2. Effects on Chemical and Physical Properties of Water Column: Because of the clean nature of the fill material, there should be a negligible effect on the chemical properties of the water column. However, there may be a slight decrease in light penetration as a result of the increases in turbidity and suspended solids.

D. Contaminant Determinations: The fill material would be clean borrow material, existing levee material, dry excavated bank material, and rock. The fill would not introduce contaminants into the aquatic system. Neither the material nor its placement should cause relocation or increases of contaminants in the aquatic system. This material is excluded from further testing as provided by 40 CFR 230.60.

E. Aquatic Ecosystem and Organism Determinations

1. Effects on Plankton: Increases in turbidity and suspended solids near the fill activities would have a localized suppressing effect on phytoplankton and zooplankton productivity. However, these local effects are not considered significant when compared to the productivity of the Souris River as a whole. The plankton populations should recover quickly once the fill and other construction activities have ceased, especially since the predominant algae present are pollution-tolerant species.

2. Effects on Benthos: Much of the fill activity would occur above the normal low flow and would have little effect on the benthic populations in the area. In addition, because much of the area would be dredged or excavated prior to fill placement, it would already be devoid of benthic life. However, approximately 11 acres of undisturbed aquatic area below normal low flow would be covered with fill material, burying and destroying all benthic life



present. After project completion, the rock substrate would probably provide habitat that is more stable and environmentally preferable to the existing habitat.

In addition to the direct burial of benthic organisms discussed above, the benthic fauna in areas immediately downstream would be subject to stress imposed by increased turbidity and suspended particulates. Sight- and filter-feeders would suffer decreased foraging abilities while the fill activity is going on. Because of the clean nature of the fill material, no toxic effects are expected on benthic organisms located on the periphery of the fill areas or in other areas downstream. The reduced flow in the channel which will be cut off by the levee should not have a significant adverse impact on benthos. Even the reduced flow would support current-loving benthos. However, the occasional closure of the culverts during times of high discharge would affect benthos. Closures of less than 15 days would probably have minimal impact on existing current-dependent benthic species, such as filter-feeders. Closure of more than 15 days would greatly reduce the numbers or eliminate most of the current-dependent species present. This situation would probably happen only about once every 5 years. Considering the rapid colonization of disturbed areas that normally occurs in a riverine habitat, the impacts of such closures would be minor.

3. Effects on Fish: High current velocities (greater than 3 feet per second) resulting from project features around Velva Park would restrict fish movement whenever river discharge is below 500 ft<sup>3</sup>/s. Under present conditions in an average year, fish would be unable to move upstream past Velva Park for all but 5 weeks in the year. Construction of project features at Lake Darling would prolong flows above 500 ft<sup>3</sup>/s so that fish may be able to move upstream past Velva for as long as 6 months. The effect of movement restrictions is expected to be negligible for two reasons: (a) spawning (the most crucial time for allowing fish movement) occurs during spring floods when flows are usually above 500 ft<sup>3</sup>/s and when the flows would not restrict fish movement; (b) area fish habitat in the area is fairly uniform, indicating that migration for spawning is not critical for maintaining existing populations.

The wetland area that would be isolated from flood flows by the levee (near point 3 on map 1) could no longer be used by fish. This area now offers only limited fish habitat because of its stagnant, high-nutrient, and low-oxygen condition. Isolation of this area caused by the project would eliminate its limited fishery value.

Some fish may be trapped in the old river channel around Velva Park when the culverts are closed during high flows, but the number trapped should not have significant effect on the river's fish population.

Fish use of the project area during project construction would be reduced by increased turbidity/suspended particulate levels and other construction disruptions. Fish use should return to normal after construction is completed.

4. Effects on the Aquatic Food Web: The long-term effect on total productivity of the area is expected to be minor, although there would be a temporary disruption to the aquatic biota present and slight changes in localized community structure and composition.

5. Effects on Special Aquatic Sites

a. Sanctuaries and Refuges: The J. Clark Salyer National Wildlife Refuge is approximately 100 river miles downstream of the project area. The proposed project is not likely to have any impact on the refuge.

b. Wetlands: Three wetland areas (excluding stream channel aquatic areas) would be affected by the proposed project (see map 1). Fill material would be placed on 0.2 acre of wetland in area 1, located along the upstream end of the proposed levee. Because an existing dike across a portion of the wetland leaves the wetland dry for most of the year, this area is of limited value. Wetland area 2 (3.9 acres) is the portion of the oxbow channel that would become part of the high discharge cutoff channel. This area would be dredged and excavated as part of the cutoff channel, and the wetland area would be severely modified. The subsequent fill activity for the levee construction and bank stabilization would therefore have minimal impact on the already highly disturbed area. Wetland area 3 is located in the old oxbow channel near the downstream edge of the levee. Approximately 0.2 acres of this wetland would be buried and removed from production permanently during construction of the levee.

Because of the small acreage of affected wetlands, their limited quality, and the abundance of similar habitat in the area, the fill activity is not expected to have significant adverse impacts on wetland habitat in the area.

6. Threatened and Endangered Species: The proposed activity should have no impact on threatened or endangered species.

7. Other Wildlife: The change from a natural bank area to a riprapped bank area would have a negative impact on bank-dwelling wildlife such as muskrat (Ondatra zibethica) and beaver (Castor canadensis).

8. Actions to Minimize Impact: Culverts would be placed in the portion of the main channel that would be cut off by the levee to allow a maximum flow of 170 ft<sup>3</sup>/s. These culverts would minimize impacts on the biota present. Culverts would also be added to the plug that would be constructed across the mouth of the oxbow channel near the downstream edge of Velva. These culverts would allow flow into the area and would reduce the barrier to fish movement that the plug would create.

F. Proposed Disposal Site Determination

1. Mixing Zone Determination: Because the fill material is clean, the mixing zone for suspended contaminants would be minimal. A turbidity and suspended particulate plume would be generated by the fill activity, but the mixing zone should be small enough that it would not impede fish movement or intersect spawning or nursery areas or municipal water intakes.

2. Determination of Compliance with Applicable Water Quality Standards: The Souris River is classified as a class IA stream by the State of North Dakota (Regulation 61-28-02). Water quality in class IA streams must be maintained at a level to permit the following: fish, wildlife, and recreation use; municipal and domestic water supply; industrial water supply; and agricultural use. Because of the clean nature of the fill material, it is unlikely that any of the fill activities would violate the North Dakota State water quality standards developed to protect these uses.

3. Potential Effects on Human Use Characteristics: The proposed high rock banks and the straightened channel would reduce the aesthetic quality of the Souris River in the project area for canoeists and hikers. In addition, during low flows (less than 500 ft<sup>3</sup>/s), small fishing boats and canoes would have to be portaged around the rock weir.

G. Determination of Cumulative Effects on the Aquatic Ecosystem: Implementation of the proposed fill activity would cause no significant cumulative impacts on the aquatic ecosystem.

H. Determination of Secondary Effects on the Aquatic Ecosystem: There should be no secondary impacts of the proposed fill activities.

### III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE

#### A. Compliance with Section 404(b)(1) Guidelines (Clean Water Act)

The proposed fill activity would comply with Section 404(b)(1) guidelines of the Clean Water Act. Other alternatives (including floodplain evacuation, construction of a diversion channel, and levee alignment alternatives) were considered but were determined not practicable because of economic and/or environmental considerations. The practicable alternatives considered include two upstream and three downstream levee alignment alternatives. The upstream alternatives would all have similar environmental impacts, but the proposed plan would be less costly. The proposed downstream levee alignment was selected because it would be the least disruptive to aquatic and terrestrial habitat in the area and because it had the lowest cost. (A more detailed evaluation of alternatives is presented in the EIS.)

#### B. Compliance with State Water Quality Standards, Section 307 (Clean Water Act), and Endangered Species Act

The proposed fill activity would comply with all State of North Dakota water quality standards, Section 307 of the Clean Water Act, and the Endangered Species Act of 1973, as amended. The proposed fill activities should not have a significant impact on human health and welfare. Plankton, benthic organisms, fish, and bank-dwelling wildlife would be disrupted because of the following factors: burial of existing aquatic habitat, change in current circulation patterns and velocity, change of physical substrate, and increased turbidity and suspended particulates during construction. However, most of these disruptions would be minor and/or temporary. The rock riprap could provide better benthic habitat than now exists, and it would reduce erosion

and turbidity. Therefore, the proposed fill activity should not have a significant adverse impact on the aquatic ecosystem diversity, productivity, and stability. There should not be any significant adverse effects on recreational values, aesthetics, and economic values of the area.

C. Steps to Minimize Potential Adverse Effects

Several steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem:

1. Dredged material would not be used as fill material; only clean material from the excavated dry bank areas, existing emergency levee, and a local borrow pit would be used. This provision would greatly reduce the chance of suspension of contaminants during placement.

2. Mechanical placement of fill material and riprapping with rock shortly after construction would reduce the effects on turbidity and suspended particulate levels and movement of material from the site.

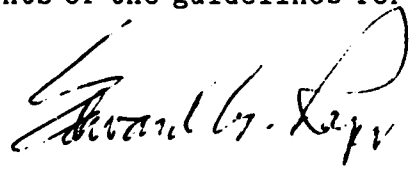
3. Culverts would be placed to allow a maximum flow of 170 ft<sup>3</sup>/s in the levee that would block off the existing channel upstream of Velva. This area could then maintain an aquatic community similar to that which now exists.

4. Installing culverts through the proposed closure of the old oxbow channel near the downstream end of Velva would allow better water circulation and would reduce the impacts on fish movement in the area.

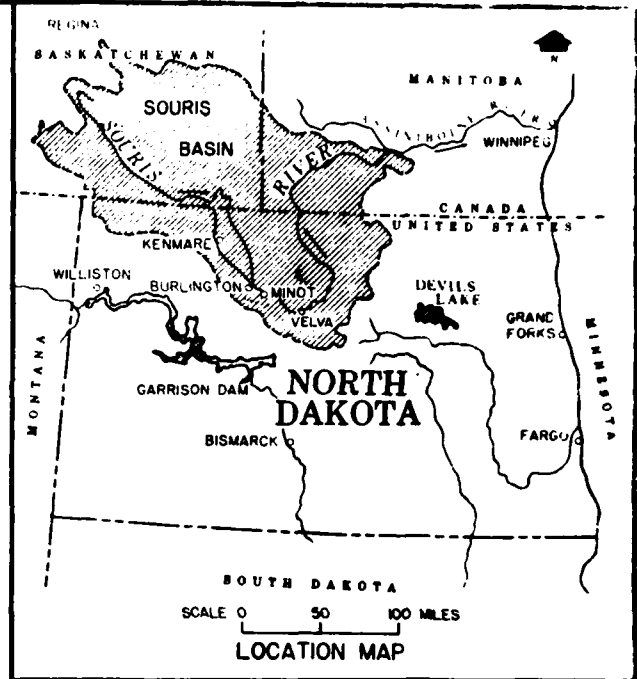
D. Determination of Compliance with the Guidelines for the Discharge of Fill Material

On the basis of this evaluation, I have determined that the proposed disposal site complies with the requirements of the guidelines for the discharge of fill material.

18 November 1983  
Date

  
Edward G. Rapp  
Colonel, Corps of Engineers  
District Engineer

MANITOBA  
NORTH DAKOTA



J CLARKE SAH II  
NATIONAL WILDLIFE REFUGE

MC HENRY CO

BUTTE COUNTY  
MC HENRY CO

BUTTE COUNTY  
MC HENRY CO PIERCE

BANTRY

TOWNER

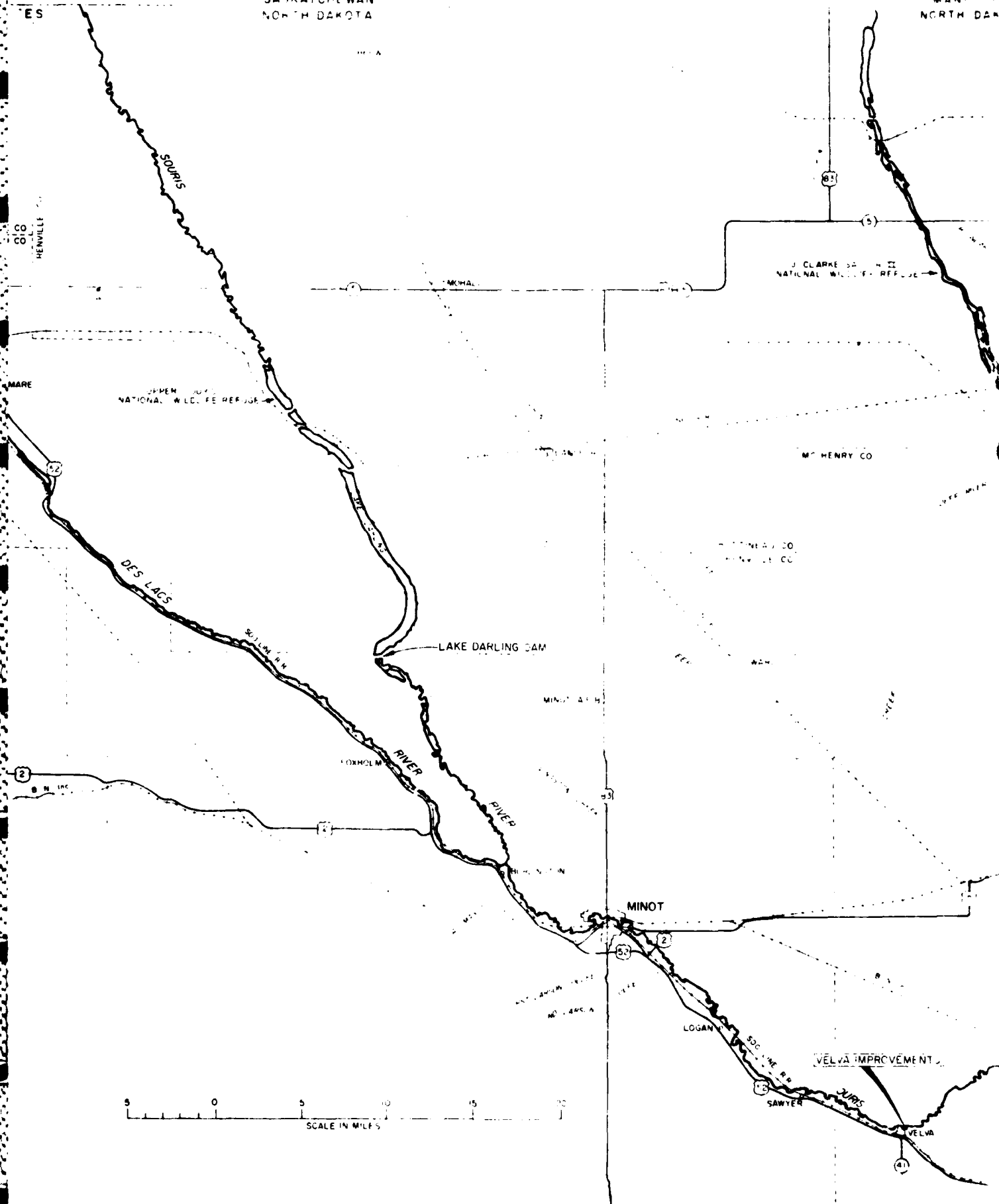
MINOT

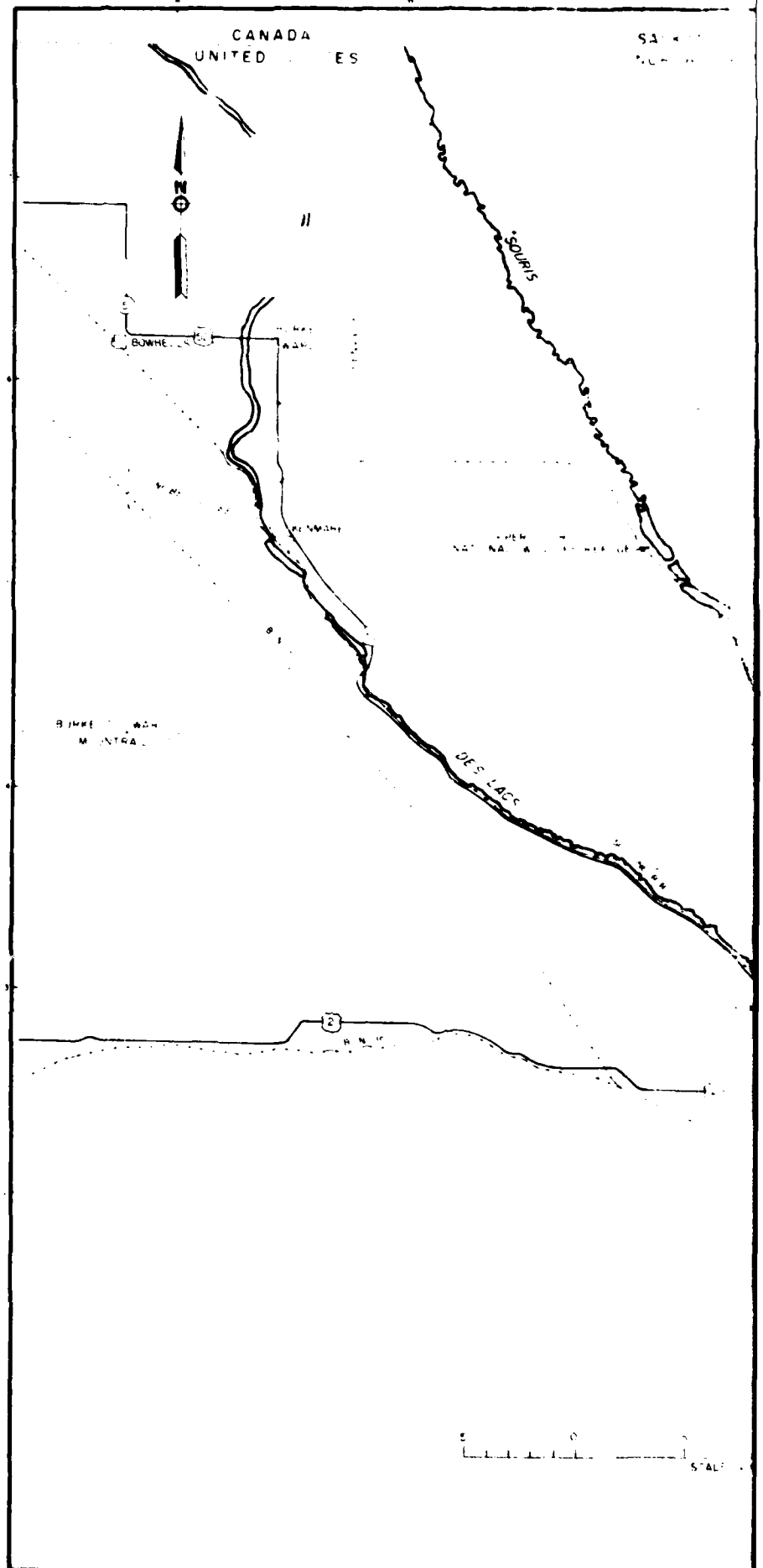
VELVA IMPROVEMENTS

FEATURE  
ENVIRONMENTAL IMPACT STATEMENT  
FLOOD CONTROL-LAKE DARLING  
SOURIS RIVER, NORTH DAKOTA  
VELVA FLOOD CONTROL  
GENERAL PROJECT LOCATION

SASKATCHEWAN  
NORTH DAKOTA

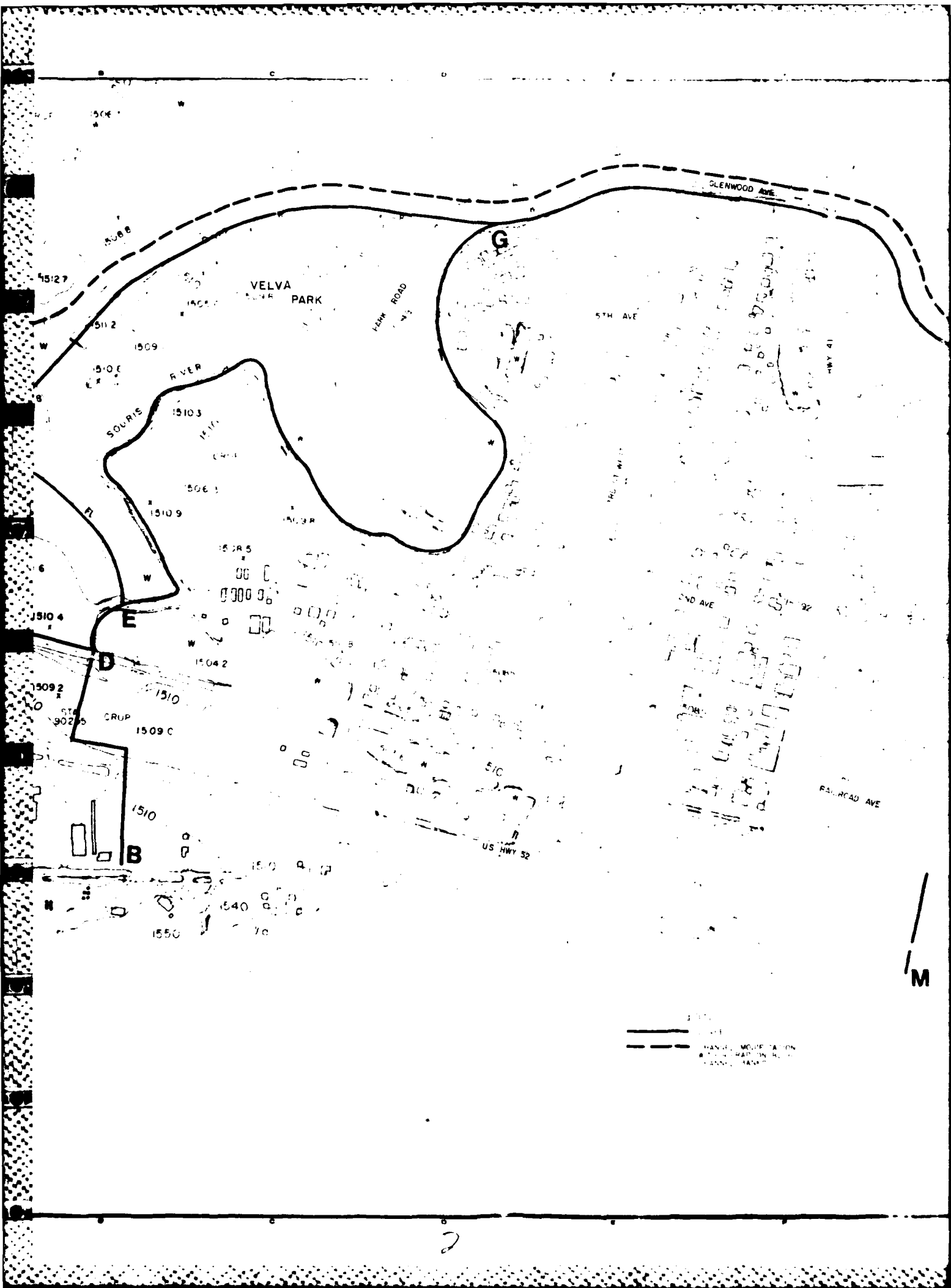
MANITOWA  
NORTH DAKOTA

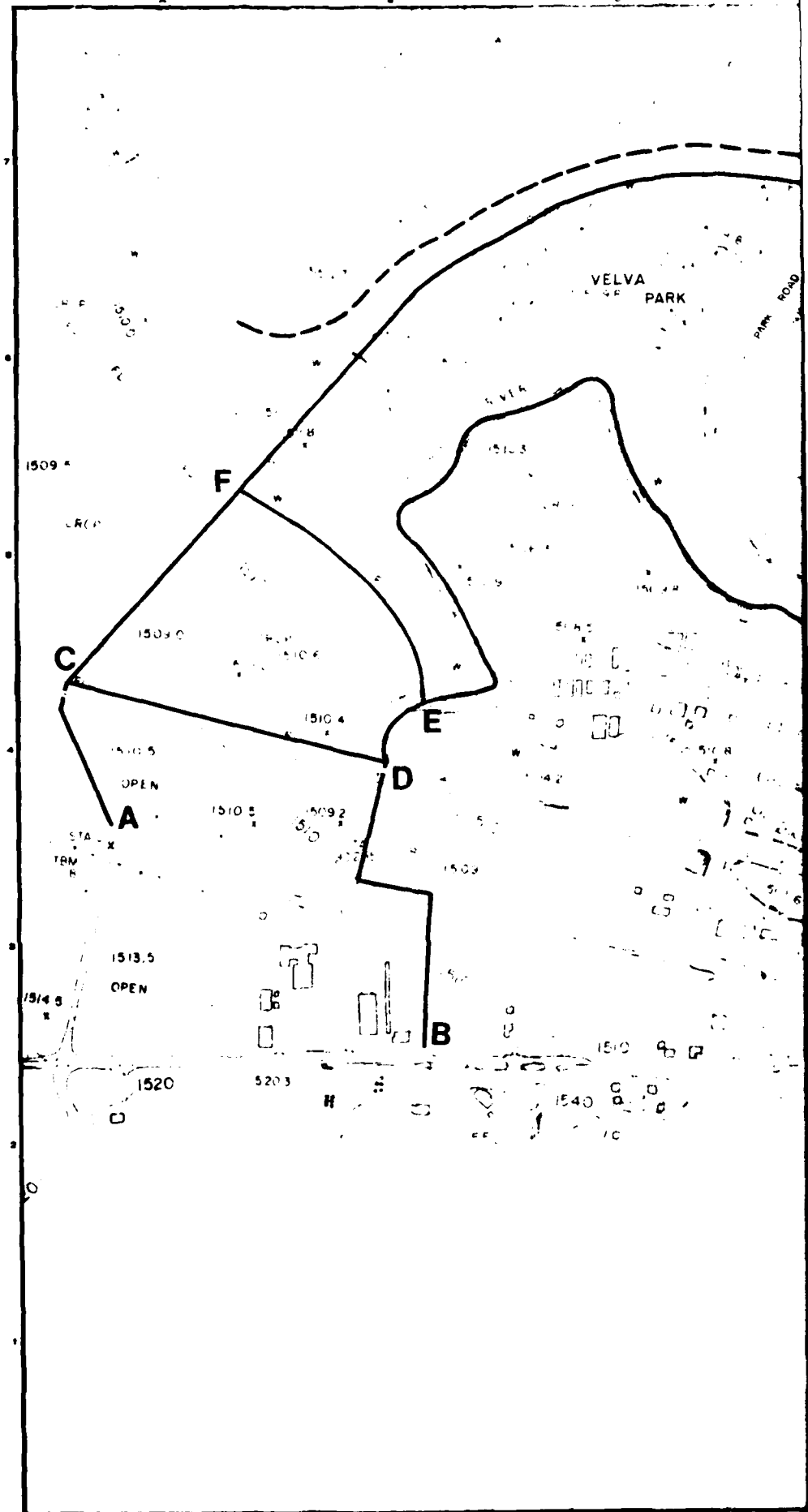




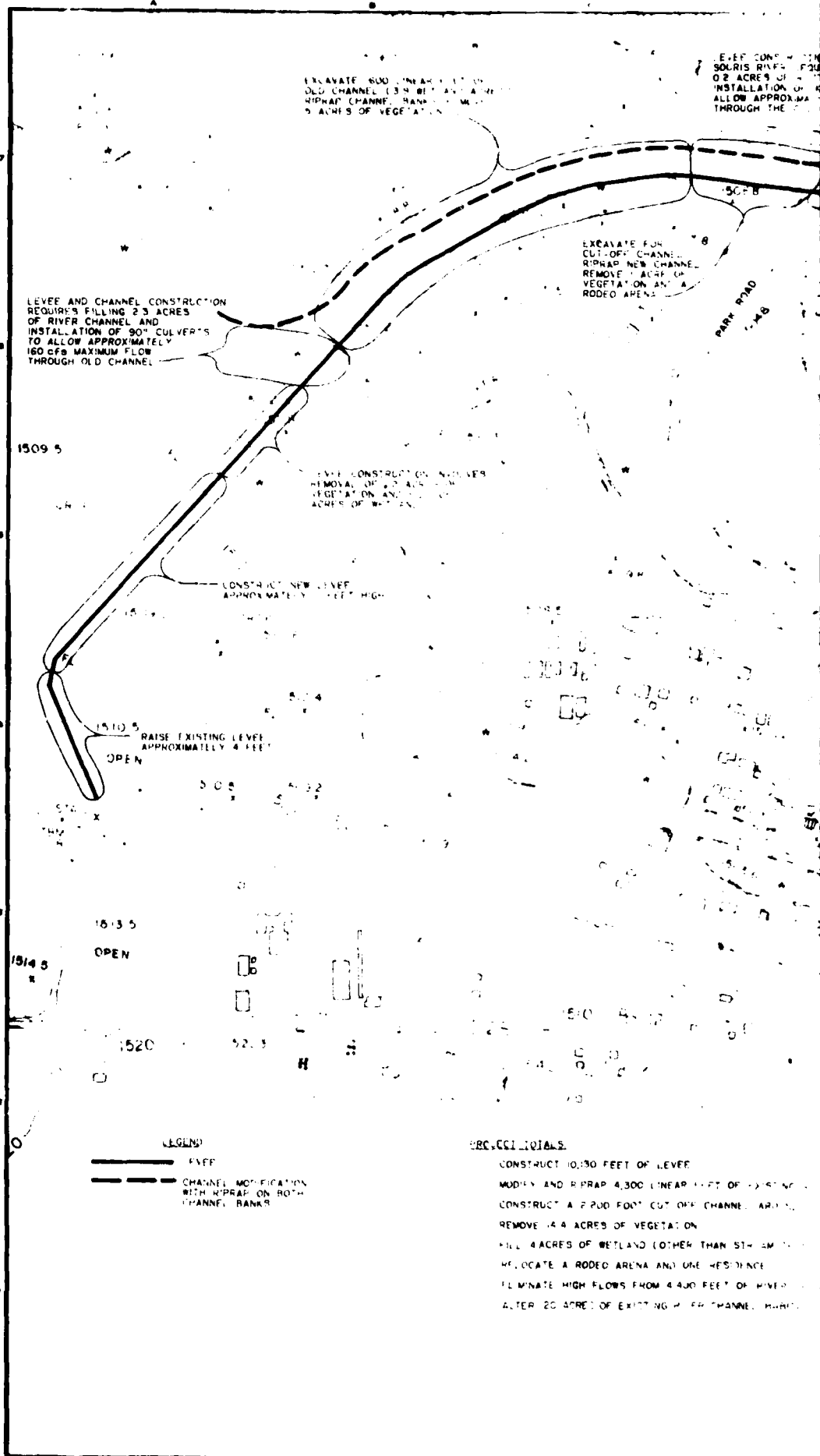
FEATURE  
ENVIRONMENTAL IMPACT STATEMENT  
FLOOD CONTROL - LAKE DARLING  
SOURIS RIVER, NORTH DAKOTA  
VELVA FLOOD CONTROL  
ALTERNATIVE LEVEE ALIGNMENTS  
ST PAUL, MINNESOTA DISTRICT  
OCT 1982







CORPS OF ENGINEERS



15067  
EXCAVATE 1600 LINEAR FEET OF  
OLD CHANNEL (3.9 WETLAND ACRES)  
RIPRAP CHANNEL BANKS REMOVE  
5 ACRES OF VEGETATION

LEVEE CONSTRUCTION ACROSS THE  
SOURIS RIVER REQUIRES FILLING  
0.2 ACRES OF RIVER CHANNEL AND  
INSTALLATION OF STRUCTURES TO  
ALLOW APPROXIMATELY 100 FEET MAXIMUM  
THROUGH THE OLD CHANNEL

EXCAVATE EXISTING CHANNEL, RIPRAP  
CHANNEL BANKS REMOVE 2.3 ACRES  
OF VEGETATION

EXCAVATE FOR  
CUT OFF CHANN  
RIPRAP NEW CHANNEL  
REMOVE 1 ACRE OF  
VEGETATION AND A  
RODEO ARENA

EXCAVATE EXISTING CHANNEL  
RIPRAP CHANNEL BANKS REMOVE  
2.3 ACRES OF VEGETATION ON  
NORTH BANK

LEVEE CONSTRUCTION INVOLVES  
REMOVAL OF 0.2 ACRES OF  
VEGETATION AND FILL OF 0.2  
ACRES OF WETLAND

NEW LEVEE  
12 FEET HIGH

SOURIS RIVER

GLENWOOD AVE

PAVY ROAD

4TH AVE

HWY 41

IRIS

15103

1509

1508

1507

1506

1505

1504

1503

1502

1501

1500

1499

1498

1497

1496

1495

1494

1493

1492

1491

1490

1489

1488

1487

1486

1485

1484

1483

1482

1481

1480

1479

1478

1477

1476

1475

1474

1473

1472

1471

1470

1469

1468

1467

1466

1465

1464

1463

1462

1461

1460

1459

1458

1457

1456

1455

1454

1453

1452

1451

1450

1449

1448

1447

1446

1445

1444

PROJECT TOTALS

- CONSTRUCT 10,130 FEET OF LEVEE
- MODIFY AND RIPRAP 4,300 LINEAR FEET OF EXISTING RIVER CHANNEL
- CONSTRUCT A 2,200 FOOT CUT OFF CHANNEL AROUND JENNA PARK
- REMOVE 14.4 ACRES OF VEGETATION
- FILL 4 ACRES OF WETLAND OUTSIDE OF RIVER CHANNEL WETLAND
- RELOCATE A RODEO ARENA AND ONE RESIDENCE
- ELIMINATE HIGH FLOWS FROM 4,400 FEET OF RIVER CHANNEL
- ALTER 20 ACRES OF EXISTING RIVER CHANNEL HABITAT

552

EXCAVATE EXISTING CHANNEL, RIPRAP  
CHANNEL BANKS REMOVE 2.3 ACRES  
OF VEGETATION

GLENWOOD AVE

LEVEE CHANNEL CONSTRUCTION REQUIRES  
FILLING 3.4 ACRES OF RIVER CHANNEL.  
RIPRAPING CHANNEL BANKS REMOVAL OF  
0.6 ACRES OF VEGETATION

EXCAVATE EXISTING CHANNEL  
RIPRAP CHANNEL BANKS REMOVE  
1.5 ACRES OF VEGETATION

EXCAVATE EXISTING CHANNEL  
RIPRAP CHANNEL BANKS REMOVE  
2.1 ACRES OF VEGETATION ON  
NORTH BANK

OSBOW WOULD BE PLUGGED  
TO PREVENT EXCESSIVE OVERLAND  
FLOW. CULVERT THROUGH PLUG  
WOULD ALLOW WATER EXCHANGE  
REMOVE 0.2 ACRES OF VEGETATION

LEVEE CONSTRUCTION INVOLVES  
REMOVAL OF 0.5 ACRES OF  
VEGETATION

RAILROAD AVE.

CONSTRUCT NEW LEVEE  
APPROXIMATELY 3 FEET HIGH

## FEATURE

ENVIRONMENTAL IMPACT STATEMENT

FLOOD CONTROL - LAKE DARLING  
SOURIS RIVER, NORTH DAKOTA

VELVA FLOOD CONTROL

PROPOSED LEVEE ALIGNMENT

EXHIBIT 1

Study Authorization

## STUDY AUTHORITY

Senate Report 97-256:

The Committee is aware of the pressing need for additional flood control measures on the Souris River to prevent serious and recurrent flooding that affects thousands of people in Minot and the outlying areas. Flood protection planning has been in progress since 1957 and more than \$25,000,000 has been spent since 1969 for emergency flood fighting activities in Minot and surrounding areas.

This implementation schedule for the project will both keep it within budget restrictions and insure significant flood control protection as quickly as possible. This phase of the Burlington Dam project has a 3.3 cost-benefit ratio. While the Committee realizes that this phase will not provide complete flood protection by itself, we feel it is a logical and cost-effective step and has the strong support of local interests.

The funds provided are to be used to raise Lake Darling by approximately 4 feet and to implement work on upstream and downstream flood control measures. This Committee directs that the Corps take no further actions to construct Burlington Dam until expressly directed to do so by the Committee.

The Committee also directs that the Corps expeditiously prepare a report on the mitigation needs related to raising Lake Darling and submit the report to Congress. It is unclear at this time whether any mitigation lands will be needed, however, we urge the Corps to carefully consider the impacts of any possible mitigation, specifically on agricultural activity and on affected landowners. An amount not to exceed \$1,000,000 from available funds shall be made available for this work in fiscal year 1982. Work on these necessary flood protection measures should proceed while the mitigation report is being prepared.

Public Law 97-88, 4 Dec. 1981 (Energy and Water Development Appropriations Act):

Sec. 111. The Chief of Engineers is hereby directed to raise the dam at Lake Darling, North Dakota, by approximately four feet and to implement upstream and downstream flood control measures.

EXHIBIT 2

Executive Order 11988  
and  
Executive Order 11990  
Analysis



## EXECUTIVE ORDER 11988

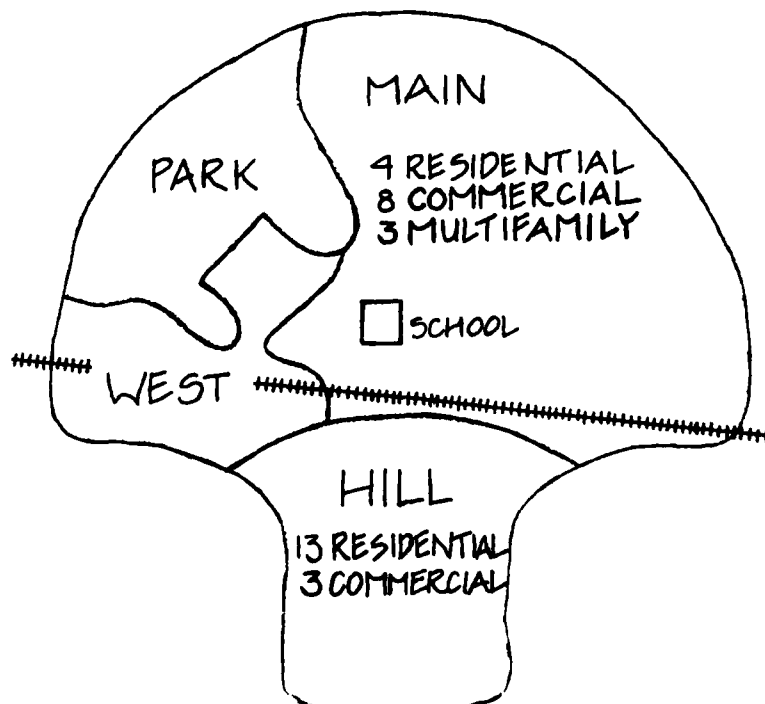
### ANALYSIS

Executive Order (EO) 11988 requires Federal agencies to recognize the significant values of floodplains and to consider the public benefits that would result from restoring and preserving floodplains. The following paragraphs evaluate the project with respect to EO 11988 under guidelines given in 33 CFR part 240 (ER 1165-2-26). The evaluation is presented in four sections: description of areas of concern, project-induced development, practicable alternatives, and modifications to the project.

#### 1. Description of Areas of Concern

In the Velva floodplain, which will be protected from the 100-year flood, three categories of development can be distinguished. The largest area (210 acres) is developed for residential and commercial use. There are a few undeveloped lots interspersed in this area, and some latent demand exists for more intensive development on presently developed lots (primarily for structural improvements and garages), pending removal of flood insurance regulations. This area would see some increases in development, but there is clearly no practicable alternative if flood protection is provided to the city as a whole. The second area is the city park. The park is a highly valued city resource, and it is very unlikely that it would experience development pressure for non-recreational use. The third area is 30 acres presently used for agriculture in the west (upstream) end of the city, across from the park and near the diversion structure. This is the area of main concern for project compliance with EO 11988.

Figure 1. Distribution of Building Permits, Velva, N.D., 1975-81.



## 2. Project-Induced Development

a. Development Without the Project. If we assume a future that basically continues present social and economic conditions and that continues floodplain regulations, development would likely continue at a similar pace. Development during the past 8 years has consistently avoided the west area (figure 1).

If the past rate (2.5 residential or multi-family permits per year) and average mix (3.1 housing units for each permit) of development continues, the next 50 years could see 125 permits issued and 380 new housing units constructed. This is a high estimate, for although Velva's housing stock did increase by 18.6 percent in the last decade, population declined by 11.3 percent.

The location of these units would depend on development costs, attractiveness, and accessibility. Accessibility is highest in the main part of town, nearly as good in the west section, and lower on the hill. Comparative attractiveness of the three areas cannot be rated for this evaluation, but many residents have retired to Velva because it is more sheltered than their windier upland farms, and the hill area may be seen as less attractive on that count. Because accessibility and attractiveness are apparently best in the main (developed) area, we may assume that about 10 percent of the permits issued would be for that area (which has minimal lot availability). The remaining 112 permits would presumably be allocated between the hill and west areas of town, based primarily on comparative development costs. Federal flood insurance regulations require placement of fill to elevate development in floodplain areas, and that cost affects land values and construction costs.

|                       | <u>West</u>                   | <u>Hill</u> |
|-----------------------|-------------------------------|-------------|
| Land cost per acre    | \$20,000                      | \$22,400    |
| Fill cost per acre    | 19,000                        | -0-         |
| Total cost per acre   | 39,000                        | 22,400      |
| Average cost per site | 9,750                         | 5,600       |
| (@ 4 sites per acre)  | (\$4,150 difference per site) |             |

Because of this difference, it seems reasonable to assume that development would continue on the hill rather than in the west area under without-project conditions.

b. Development With the Project. The only factors which would be significantly changed are assumed to be the land costs and necessity for fill in the floodplain. With the project, development costs for the two areas would be:

|                       | <u>West</u>                 | <u>Hill</u> |
|-----------------------|-----------------------------|-------------|
| Land cost per acre    | \$24,000                    | \$22,400    |
| Fill cost per acre    | -0-                         | -0-         |
| Total cost per acre   | 24,000                      | 22,400      |
| Average cost per site | 6,000                       | 5,600       |
| (@ 4 sites per acre)  | (\$400 difference per site) |             |

The project would reduce the absolute development costs in the west area floodplain and would reduce the difference in development costs between that area and the hill area. Because the accessibility and attractiveness (shelter) factors are somewhat better for the west area, this cost difference will no longer preclude development there. Perhaps half of the 112 projected permits would be issued for the west area if the flood protection project were in place.

c. Conclusion. A reasonable estimate of floodplain (west area) development indicates 56 permits with the project and none without. The project as it is presently formulated would therefore induce development.

### 3. Practicable Alternatives

Alignment ACDEFGHIKM, a practicable alternative to the recommended alignment, does not induce development on a 15-acre parcel in the western area. Although this alternative alignment is longer than the recommended alignment, its environmental impacts are basically equivalent to those of the recommended alternative, and the cost increases would not significantly change overall project costs.

There are practicable alternatives to new development in the west area. As shown in figure 1, present development is being increasingly attracted to the hill area, and considerable future development is already platted there. Even with the project, 56 permits could be issued for the hill area over the next 50 years. This area is a reasonable alternative to floodplain development, and it could absorb all future development needs, if the city develops appropriate land use plans.

### 4. Conclusions

When the draft EIS was distributed, the project was not in compliance with EO 11988 because there was a practicable alternative to the recommended alignment that induced less development in the floodplain. Since publication of the draft EIS, the city agreed to adopt zoning restrictions that would preserve existing land use on recreational or agricultural lands which the proposed project would remove from the floodplain. This restriction allows the city some flexibility in its recreational development and also assures that the recommended alignment would not induce development of floodplain lands. Given the current situation, there is no practicable alternative alignment that would induce less development than the recommended alignment; hence the proposed project now complies with EO 11988.

EXECUTIVE ORDER 11990  
ANALYSIS

Executive Order (EO) 11990 recognizes the significant values provided by wetlands and provides specific measures for their protection. The following paragraphs evaluate the project with respect to EO 11990 using guidelines published in the Federal Register (10 June 1980, page 39412). The evaluation is presented in three sections: analysis of alternatives, methods to minimize impacts, and statement of compliance.

1. Analysis of Alternatives

Of the alternatives considered, only one would involve less impact on wetlands than the recommended alternative would. This alternative called for relocation of the entire city of Velva and was not practical because of excessive costs and social disruption.

2. Methods to Minimize Impact

Two features were incorporated into the recommended plan for the purpose of minimizing impacts. These include providing maximum flows of 160 ft<sup>3</sup>/s to the old river channel around Velva Park and installing a culvert to provide water to the oxbow wetland surrounding the Velva Natural Area. One feature (placement of rocks in the stream channel to improve fish habitat) will be studied during development of plans and specifications for construction. Three additional features for minimizing adverse wetland impacts were studied and found to be impractical.

The following sections describe these features and summarize why they are considered impractical:

a. Enhancing flows to wetlands inside the levee near point H (see plate 2). Resistance to flow is much less in the river channel than it would be through the wetland area. Therefore, even if the wetland were open to the main channel, resistance to flow would prevent water from entering the wetland area. Enhancing flows to the wetland would require construction of a wier that would divert water into the wetland. The cost of this wier made flow enhancement for this wetland impractical.

b. Creation of Wetlands in the Area. Creation of wetlands in conjunction with the Velva portion of the Lake Darling project is impractical because of the lack of suitable sites near Velva. Creation of wetlands at the borrow sites depends upon the hydrologic characteristics of the site. The practicability of this measure would be determined once borrow sites are selected.

c. Use of larger culverts to decrease velocities and minimize restrictions on fish movement in the Velva Park area. To minimize effects on fish movement, 15-foot diameter culverts would be required. Such large culverts are impractical because of the costs of the closure structures needed during high-flow periods.

### 3. Statement of Compliance

The proposed project complies with EO 11990 for the following reasons: (1) there is no practicable alternative to the recommended plan that involves less wetland damage; (2) the public was involved throughout the study (see section 7.00 in the EIS); (3) minimizing adverse effects on wetlands was an important consideration in designating a recommended plan.

EXHIBIT 3

Fish and Wildlife Coordination Act Report  
and  
Corps Responses

## CORPS RESPONSES TO FISH AND WILDLIFE SERVICE RECOMMENDATIONS

The following are Fish and Wildlife Service (FWS) recommendations and specific Corps responses. The Corps will maintain coordination with the FWS to insure that all of the FWS recommendations are adopted to the maximum extent possible during development of plans and specifications for construction.

FWS Recommendation 1. Work in the watercourse be timed to avoid the principal fish spawning months of March, April and May.

Corps Response. Recommendation adopted.

FWS Recommendation 2. Borrow areas for levee material should be located outside woodlands or other high-value habitat areas, preferably in existing active pits. Any new borrow areas should be reviewed by FWS and NDGFD (North Dakota Game and Fish Department) prior to approval.

Corps Response. Recommendation adopted.

FWS Recommendation 3. Plans be designed and construction conducted in a manner which avoids woodlands to the extent possible. Felled trees should be disposed of in an approved dump site, used as firewood, or left in constructed brush piles.

Corps Response. The project design avoids woodlands as much as possible. Disposal methods for felled trees would be developed in conjunction with plans and specifications for construction. These methods would promote constructive uses of the disposal material to the extent practical.

FWS Recommendation 4. Riprapping the south bank of the widened river channel extend as far as possible below the normal flow line and include one or more areas of bottom substrate. Additional costs have not been determined. The location and extent of the rock placement will be determined during detailed planning.

Corps Response. Under current project proposals, riprap on both channel banks would extend down the banks and a short distance into the channel bottom. Riprap would also be placed across the entire channel bottom in the vicinity of the highway 41 bridge. Although placement of additional riprap or large rocks was investigated, the Corps of Engineers concluded that these measures would not significantly improve aquatic habitat in the channel (see paragraph 4.32 for further details).

FWS Recommendation 5. Twenty-eight acres, or two times the direct loss of wooded cover, be planted by the Corps of Engineers on project lands. Such plantings will be in multirow blocks along the north channel banks of the modified river channel above elevation 1518, the high flow channel, and on other available sites. Species and planting designs will be coordinated with the North Dakota Game and Fish Department during detailed planning. Estimated cost for 28 acres is \$7,000 for planting and \$7,000 for 5 years of maintenance.

Corps Response. A detailed analysis of future with- and without-project conditions showed that net vegetation losses caused by the project would be only 3.5 acres (see paragraph 4.27). It is the opinion of the Corps that these losses would not be significant and therefore would not require specific mitigation measures. Although mitigation measures would not be required, additional land for replacement of the 3.5-acre vegetation loss may become available as project lands are purchased (uneconomic remnants, etc.). All of these additional lands in addition to lands at other project sites would be investigated for their suitability for vegetation planting as is usually done as part of project design for erosion control and beautification.

FWS Recommendation 6. All disturbed areas and levee slopes be planted with native grass species. Planting rates, species and maintenance recommendations will be determined during detailed planning. Estimated costs are \$70 per acre for establishing grass and \$10 per acre for annual maintenance.

Corps Response. Recommendation adopted.

FWS Recommendation 7. Compensation of wetland losses up to 5 acres be accomplished by the Corps of Engineers by development of new wetlands and by preventing drainage of and providing water supply to existing oxbow channels. Additional costs for this compensation can be determined in the next phase of study. Water supply feasibility be investigated from the river channel to the upstream and downstream oxbows and from pumping stations. Feasibility of high flow channel and other types of wetland development by excavation, diking or combinations of both, be determined.

Corps Response. The river channel and oxbow wetland upstream of the wier would be inundated under all flow conditions, and their wetland habitat should therefore be retained. Enhancing flows to the 5-acre wetland next to the cutoff channel and providing continuous flows through the downstream oxbow surrounding the Velva Natural Area are not possible without major structural modifications (construction of additional weirs and two gated outlet structures). Because the modifications would add considerable expense, they are considered impractical. Creation of wetlands at borrow sites may be possible; however, the practicability of this recommendation must be determined after the borrow areas have been selected.

FWS Recommendation 8. Normal flows to 140 ft<sup>3</sup>/s be maintained through the channel around Velva Park.

Corps Response. Maximum flows of 170 ft<sup>3</sup>/s would be possible through the channel around Velva Park. The operating plan that would control flows through the old channel is explained in paragraph 6.02.d.



**UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE**

**BISMARCK FIELD OFFICE**



**SOURIS RIVER AT VELVA  
NORTH DAKOTA**

**REPORT ON FISH AND WILDLIFE RESOURCES**

**JANUARY 1983**

UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE RESOURCES  
IN RELATION TO THE  
SOURIS RIVER AT VELVA  
FLOOD CONTROL PROJECT  
NORTH DAKOTA

PREPARED BY:

BISMARCK FIELD OFFICE  
U.S. FISH AND WILDLIFE SERVICE  
BISMARCK, NORTH DAKOTA



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

—NORTH DAKOTA  
1500 CAPITOL AVENUE  
BISMARCK, NORTH DAKOTA 58501



JAN 20 1983

- Colonel Edward G. Rapp, District Engineer  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

This Fish and Wildlife Report provides an assessment of the local flood control project on the Souris River at Velva, North Dakota. This report is to accompany the Corps of Engineers Detailed Project Report through the final review process. It has been prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, amended; 16 U.S.C. 661 et seq.). It is also consistent with the intent of the National Environmental Policy Act of 1969 (P.L. 91-190; 83 Stat. 852,856). It addresses the effects of the proposed project on fish and wildlife resources, and conveys recommendations which are designed to prevent, mitigate or compensate adverse effects to these resources. This report supercedes all previous reports which apply to Velva. Comments on the conclusion and recommendations of this report by the North Dakota Game and Fish Department (NDGFD) are contained in the attached letter dated August 24, 1982, by Commissioner Dale Henegar.

Section 7(c) of the Endangered Species Act, 87 Stat. 884, as amended, requires that your agency ask the Secretary of the Interior, through the U.S. Fish and Wildlife Service, whether any listed or proposed endangered or threatened species may be present in the area of each federal construction project. The whooping crane (Grus americana), peregrine falcon (Falco peregrinus) and bald eagle (Haliaeetus leucocephalus) may be present in the project area. All three species are present as migrants or in a transient status during spring and fall seasons. Your environmental document or a separate biological assessment should address these species and provide conclusions as to whether or not the project is likely to affect them.

A Department of the Army permit, issued pursuant to Section 404 (P.L. 92-500) may be required for the placement of fill material into the Souris River for construction of the channel and levee system.

In the view of the Service, the plan is in compliance with Executive Order 11988, Floodplain Management. While construction will take place on the Souris River floodplain, wildlife habitat and other environmental values should not be seriously affected provided mitigation recommendations are accepted and implemented.

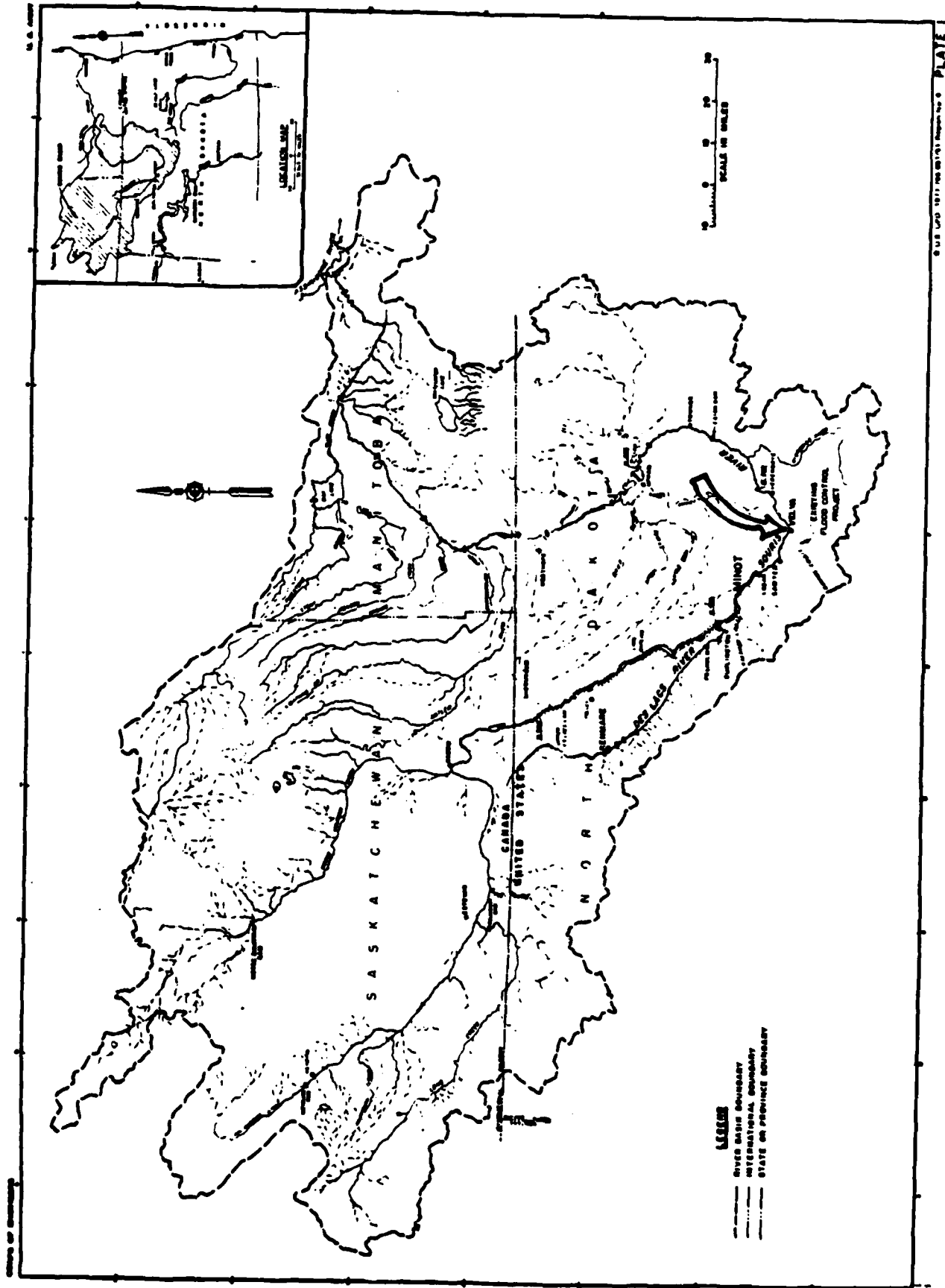
Our recommendations and associated costs for mitigating and compensating project-induced fish and wildlife losses are consistent with the Presidential Directive (of June 1978) on environmental quality and water resources management. That directive states:

In all project construction appropriation requests, agencies shall include designated funds for all environmental mitigation required for the project and shall require that mitigation funds be spent concurrently and proportionately with construction funds throughout the life of the project.

#### DESCRIPTION OF THE AREA

Velva is located near the western edge of McHenry County at the southern terminus of the Souris River Loop (see map). This city of 1,101 people parallels the south bank of the Souris River for nearly 1 mile. It is essentially all within the river floodplain. The Souris River, a tributary of the Assiniboine River, has a total watershed area of about 11,000 square miles at Velva.

The surrounding area is glacial ground moraine containing numerous prairie pothole wetlands and is used principally for growing small grains, sunflowers, hay and livestock. The valley floor is flat and about three-fourths mile in width. The Souris River is very sinuous (about two to one) with numerous channel changes which create oxbow wetlands. The adjacent riparian forest community ranges up to one-half mile in width where river loops have inhibited clearing. Souris River flows are typical of prairie streams, ranging from no-flow occurrences (except for reservoir releases) in summer and fall to valley wide spring floods, which usually occur in April and May. Tributary drainages occasionally have severe floods from heavy rainstorms as well as from spring runoff. The main stem channel averages 80 feet in width and 12 feet in depth.



U.S. GEO. SURV. 1917, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025

## DESCRIPTION OF THE PROJECT

A flood prevention project consisting principally of channel and levee work was installed on the small tributary of Bonnes Coulee following the flash flood of 1962. No changes are presently being recommended.

A levee system to reduce damages to Velva from the Souris River was installed on an emergency basis in 1969 during the flood period. Improvements to the system to prevent further damages were made in 1970 and 1976.

The present proposal is basically an upgrade of the existing system to withstand a 100-year flood event, in conjunction with project features at Lake Darling, of 14,700 cfs peak flow of the Souris. Included are a high flow cutoff channel and a new levee alignment on the west side of Velva, interior drainage facilities and consideration of alternative levee alignments at both ends of the existing project. A control structure on the cutoff channel would provide for normal low flows through the existing river loop in Velva Park. Channel widening and straightening for a distance of approximately 3,330 feet below the cutoff channel would take place to facilitate passage of the high flows.

The earth levee would be approximately 10,130 feet in length with an average height of 8 feet, top width of 10 feet and 3:1 side slopes.

## EVALUATION METHODOLOGY

The Habitat Evaluation Procedures were not used in field investigations. They were not appropriate for this study, which utilized primarily existing data during a short time period.

Inspections of the watershed area and the project site were supplemented by determining impacts from analyzing aerial imagery, maps of project features and descriptions provided by the Corps of Engineers.

## FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

Terrestrial Resources

Woodlands - The principal project area terrestrial habitat is the riparian, or floodplain forest which parallels the river. Patches of native woodlands also occur in the tributary drainages. Farmstead and field shelterbelts and urban tree plantings supplement this resource. The wooded corridor provides habitat for white-tailed deer and nesting wood ducks. Raptors nest and hunt in the valley. The woodlands also provide year-round habitat for songbirds and migratory habitat for a variety of passerine species.

Wetlands - Within the valley area, wetlands are restricted to the riverine and palustrine types, which consist of the live and cutoff river channels, respectively. The surrounding moraine contains the palustrine pothole wetlands. Waterfowl use in the immediate project area consists mainly of nesting wood ducks, but mallards and other species also use the river. Furbearers include beaver, muskrat, mink and raccoon. Water birds such as black-crowned night herons and grebes also occupy these habitats along with blackbirds, marsh wrens and many other bird species.

Grasslands - Remaining grasslands exist principally in association with steep valley breaks, wet meadows and light sandy soils. Conservation of remaining grasslands is an important component of wildlife resource objectives. Values are increased for those areas associated with wetlands and woodlands.

Future Conditions - Gradual conversion of the three terrestrial habitat types to cropland is expected to continue in the watershed. If irrigation projects are developed, habitat loss rates will increase correspondingly.

Aquatic Resources

Under the North Dakota permanent stream evaluation, the Souris River from Canadian border to Canadian border is rated Class I, Critical. Its high fishery value is due to excellent forage fish production, a good sport fishery

on northern pike, yellow perch and walleye, and excellent reproduction of northern pike. The river also receives moderate recreational usage. The present fishery value is dependent on high spring flows which allow for spawning and movement of the fish populations. Many areas of this river winterkill periodically, which also makes the fish movements more important. (Reference: North Dakota Permanent Stream Evaluation.)

Water quality, together with frequent no-flow conditions, are limiting factors to the fishery. Nonpoint source pollution, municipal wastes, industrial discharge and wetland drainage are the principal sources of the water quality problems. As new wastewater treatment plants are constructed, pollution from those sources will decline. Wetland drainage is expected to continue and will offset to some degree the reductions in point sources.

#### Mitigation Policy

The habitat to be impacted consists of riverine elements of floodplain forest, live and cutoff river channel, and some agricultural land. These correspond with Resource Category 3 of the Fish and Wildlife Mitigation Policy. The designation criteria for these habitats are: high-to-medium value for evaluation species and is relatively abundant on a national basis. The goal is no net loss of total habitat value.

#### EVALUATION OF ALTERNATIVE PLANS

During previous studies, the nonstructural measures of floodplain evacuation, floodproofing, floodplain regulations, flood insurance and combinations thereof were evaluated by the Corps of Engineers.

The present study included review of the floodplain evacuation alternative, a diversion channel alternative, five upstream levee alignments and three downstream levee alignments. After a preliminary review, the evacuation, diversion channel and three upstream alignments were eliminated from further consideration by the Corps of Engineers. Only the proposed plan and the remaining levee alignment alternatives described in this report were evaluated by the Fish and Wildlife Service.



### Levee Alignment Alternatives

Three alignments at the downstream end and two at the upstream end were given detailed consideration. As shown on the enclosed Plate 2, they are: ACFG, ACDEFG, GHIKM, GHIJL and GHJL. The same design criteria were applied to all of them.

The principal differences in impact for the two upstream alignments relates to the fact that ACFG would enclose about 16 acres of cropland. This area would be subject to induced development for residential or industrial purposes. Since the cropland provides little in the way of wildlife value and is abundant in the vicinity, no significant adverse effect would occur unless the subsequent development encroached upon or otherwise affected the adjacent wetland area.

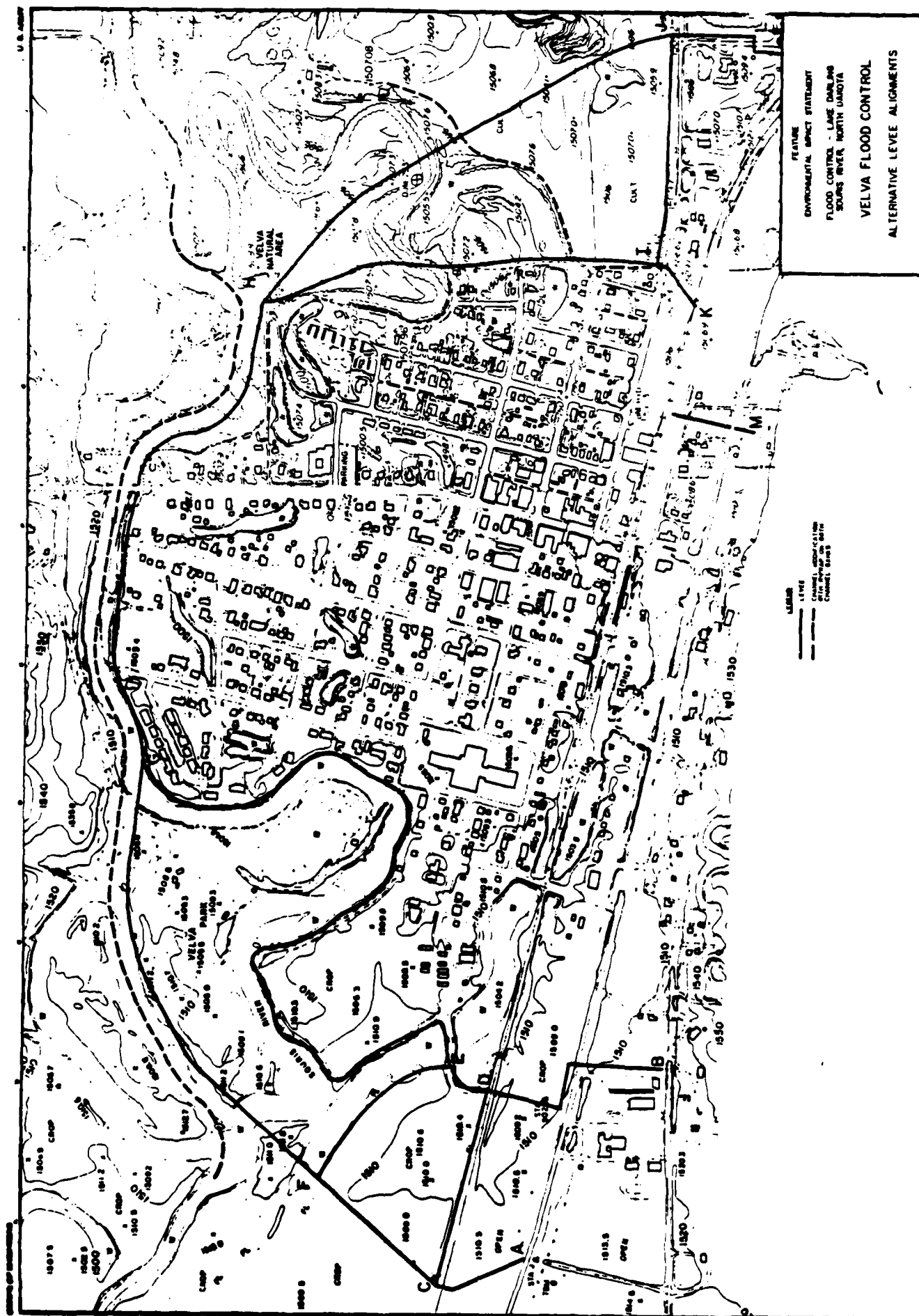
The downstream alternative GHJL would bisect a 20-acre wooded area inside a cutoff oxbow. The area is owned and used by the city as a natural area and includes a nature walk. In addition to clearing about 2 acres of the floodplain forest, the portion of the area inside the levee would be subjected to increased developmental pressure. This alignment was not recommended.

The other two downstream alignments differ principally in the amount of developed areas protected. There is no significant difference in terms of fish and wildlife impact.

After final analysis, alignment ACFG-HIKM was recommended by the Corps of Engineers. The decision was based partly on economic and partly on environmental and floodplain considerations.

The selected plan will have the following impacts:

1. 14.9 acres of natural woody vegetation will be destroyed.
2. 4.3 acres of palustrine wetlands, primarily oxbows, will be altered at three locations. This includes 0.4 acres of filling and 3.9 acres of excavation. An additional 5 acres could be drained as a result of the excavation.



3. Sediments and possibly other pollutants from construction activities will be added to the watercourse.
4. High flows will be eliminated from about 4,400 feet of river channel.
5. About 6.5 acres of riverine wetland, or live river channel, will be altered. This includes filling about .5 acres at two levee crossings, and widening and straightening about 3,300 feet or 6 acres. The channel alterations will temporarily disrupt fish habitat, removing streamside vegetation, substrate and benthic invertebrates. There will also be direct disturbance of fish and increased turbidities. The channel length will be reduced by about 250 feet. Together with the two channel fills, there will be a permanent loss of about 350 feet in channel length.

Approximately 14 acres of natural wooded area and 9 acres of open space that is presently outside the levee will be enclosed within the new levee. This area is presently a city park. This land use is not expected to change, although some park facilities may be relocated as a result of the project.

Interior ponding during flood events will contain the runoff water primarily in existing oxbow channels. The interior drainage facilities are not expected to have any significant impact. Use of these existing wet areas will help to preserve them.

#### DISCUSSION/MITIGATION ENHANCEMENT

The adverse effects of the selected plan can be reduced by several methods. One way is to use construction methods that minimize clearing, erosion and pollution into the watercourse. Avoidance of work in the watercourse during the spawning season (March, April and May) will reduce the disruption of fish movements.

The loss of woody vegetation should be compensated by plantings, to the extent feasible. The normal requirement by the North Dakota Game and Fish Department is for a replacement ratio of 2 acres of plantings for each acre of loss. If sufficient project lands are available or other sites can be located in the area, plantings totalling 28 acres are required. As a minimum, the north banks of the cutoff channel and the downstream 3,330 feet of modified natural channel should be replanted. These woody plantings should be as wide as possible.

All disturbed areas required to be kept open and levee slopes should be revegetated with native herbaceous plantings.

The use of channel riprap, in addition to stabilization, can provide substrate for fish food organisms and fish spawning. Placement of rock below the high-water mark and on portions of the channel bottom would be most effective.

The direct losses of palustrine wetlands may be compensated by development of additional wetlands and/or providing improved water supply to several oxbow areas. The feasibility of such developments should be examined at the following locations:

1. The oxbow to be excavated for the high flow channel. In the unexcavated north loop, weirs or other barriers should be retained or installed at both ends as necessary to prevent drainage. The upper end of this loop should be investigated for the feasibility of improving recharge by means of adding an inlet feature. The high flow channel itself may be beaded or diked to provide wetland habitat.
2. The oxbow area surrounding the wooded natural area, near the downstream end of the project. Water recharge may be possible by installing an inlet culvert from the river channel.
3. Borrow sites should be evaluated for wetland development potential.

Exclusion of high flows from the Veřva Park river loop will restrict fish entry and exit if control gates are completely closed. It is preferred, from a fishery standpoint, to continue flows through the park loop during flood events. This is when major movements are likely to occur. A less desirable alternative is that gates should be reopened as soon as possible during flood recessions. The absence of flood flows in the loop will reduce productivity of the riparian vegetation, but should not materially affect the existing fishery. The impacts of reduced water availability and barriers to fish movements will be reduced by allowing the maximum allowable flows through the loop (estimated at 170 cfs), and to retain flow during flood recession periods.

#### RECOMMENDATIONS

1. Work in the watercourse be timed to avoid the principal fish spawning months of March, April and May.
2. Borrow areas for levee material should be located outside woodlands or other high-value habitat areas, preferably in existing active pits. Any new borrow areas should be reviewed by FWS and NDGFD prior to approval.
3. Plans be designed and construction conducted in a manner which avoids woodlands to the extent possible. Felled trees should be disposed of in an approved dump site, used as firewood or left in constructed brush piles.
4. Riprapping the south bank of the widened river channel extend as far as possible below the normal flow line and include one or more areas of bottom substrate. Additional costs have not been determined. The location and extent of the rock placement will be determined during detailed planning.
5. Twenty-eight acres, or two times the direct loss of wooded cover, be planted by the Corps of Engineers on project lands. Such plantings will be in multirow blocks along the north channel banks of the modified

river channel above elevation 1518, the high flow channel, and on other available sites. Species and planting designs will be coordinated with the North Dakota Game and Fish Department during detailed planning. Estimated cost for 28 acres is \$7,000 for planting and \$7,000 for 5 years of maintenance.

6. All disturbed areas and levee slopes be planted with native grass species. Planting rates, species and maintenance recommendations will be determined during detailed planning. Estimated costs are \$70 per acre for establishing grass and \$10 per acre for annual maintenance.
7. Compensation of wetland losses up to 5 acres be accomplished by the Corps of Engineers by development of new wetlands and by preventing drainage of and providing water supply to existing oxbow channels. Additional costs for this compensation can be determined in the next phase of study. Water supply feasibility be investigated from the river channel to the upstream and downstream oxbows. Feasibility of high flow channel and other types of wetland development by excavation, diking or combinations of both, be determined.
8. Normal flows to 170 cfs be maintained through the channel around Velva Park.

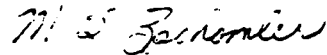
#### -SUMMARY

This reports the Service's assessment of the Velva project. Harmful environmental effects are relatively minor and susceptible to reduction and compensation through careful planning. The selected plan is acceptable from a fish and wildlife standpoint.

Implementation of the above recommendations will prevent, mitigate or compensate for adverse effects on fish and wildlife resources. If implemented, the Service will have no objection to project construction.

We appreciate this opportunity to provide the evaluation and recommendations for fish and wildlife resources in the Velva area. Please notify us of any changes in project plans and contact us if you have any questions concerning this report. We also request that you inform us of actions taken on each of the recommendations.

Sincerely,



M. S. Zschomler  
Field Supervisor-Habitat Preservation

Attachment



" VARIETY IN HUNTING AND FISHING "

## NORTH DAKOTA GAME AND FISH DEPARTMENT

2121 LOVETT AVE.

BISMARCK, N. DAK. 58505

PHONE 701-2

August 24, 1982

Mr. M. S. Zschomler  
Field Supervisor - Environment  
Bismarck Field Office  
US Fish and Wildlife Service  
Bismarck, ND 58501

Re: Report on the fish and wildlife  
resources in relation to the  
Souris River at Velva flood  
control project

Dear Mr. Zschomler:

The North Dakota Game and Fish Department concurs with the above referenced report of the US Fish and Wildlife Service. We would add only that those mitigation measures which can be effectuated outside the proposed levee should be given highest consideration. As the details of this project are finalized, perhaps we will be able to develop some additional habitat recommendations outside the levee as compensation for woodlands, oxbows, etc., which will remain inside the levee. It would seem that such an arrangement would be more compatible with future city planning and with securing replacement of wildlife habitats.

Sincerely,

  
Dale L. Henegar  
Commissioner

S:DLH:dk

Dale L. Henegar  
COMMISSIONER

Charles H. Schroeder  
DEPUTY COMMISSIONER



**EXHIBIT 4**

**EIS Distribution**

Hon. Mark Adams  
State Senator  
R.R.  
Lansford, ND 58750

Hon. Orlin Hanson  
State Representative  
Rt. 2, Box 22  
Sherwood, ND 58782

Hon. Mike Timm  
State Representative  
P.O. Box 29  
Minot, ND 58701

Hon. Hal Christensen  
State Senator  
307 Eighth St., NW  
Minot, ND 58701

Hon. Brynhild Haugland  
State Representative  
P.O. Box 1684  
Minot, ND 58701

Hon. Janet Wentz  
State Representative  
505 Eighth Ave.,  
Minot, ND 58701

Hon. Rolland Redlin  
State Senator  
1005 21st NW  
Minot, ND 58701

Hon. Carolyn Houmann  
State Representative  
Westhope, ND 58793

Hon. Chester Reiten  
State Senator  
2021 Ida Mae Ct.  
Minot, ND 58701

Hon. Franklin Huwe  
State Representative  
620 10th Ave., SE  
Minot, ND 58701

The Wildlife Soc  
Rt. 2  
Jamestown, ND 5

Hon. Marvin E. Sorum  
State Senator  
701 First Ave., NE  
Kenmare, ND 58746

Hon. David Koland  
State Representative  
801 Clark Dr.  
Minot, ND 58701

Hon. Jerome L. Walsh  
State Senator  
Rt. 1  
Minot, ND 58701

Hon. Lawrence D. Marsden  
State Representative  
413 Spruce St.  
Bottineau, ND 58318

Hon. Stanley Wright  
State Senator  
Box 97  
Stanley, ND 58784

Hon. Douglas Mattson  
State Representative  
330 11th St., NW  
Minot, ND 58701

Hon. Jim Peterson  
State Representative  
516 Eighth St., NW  
minot, ND 58701

Hon. Charles Anderson  
State Representative  
Rt. 1, Box 113  
Voltaire, ND 58792

Hon. Ryden Reud  
State Representative  
Box 1666  
Minot, ND 58701

Hon. Richard J. Backes  
State Representative  
Glenburn, ND 58740

Hon. Jim Sorum  
State Representative  
Flaxton, ND 58737

Soil Cons. Service  
Federal Bldg, P.O. Box 1458  
Bismarck, ND 58501 (2)

U.S. Forest Service  
National Forest System  
Federal Building  
Missoula, MT 59801

Deputy Reg. Forester  
Forest Service  
Federal Building  
Missoula, MT 59801

ND Coordinator, Custer NF  
1824 North 11th Street  
Bismarck, ND 58501

Chief, River Basin Pln. Br.  
USDA, SCS  
P.O. Box 2890  
Washington, D.C. 20013

Deputy Asst. Sec. for Env.  
Affairs  
Department of Commerce  
Washington, D.C. 20230 ( )

Director  
Office of Fed. Activities  
U.S. EPA  
Washington, D.C. 20460 ( )

Region VIII  
U.S. EPA  
1860 Lincoln Street  
Denver, CO 80203 (5)

Garrison Diver. Conserv. Dist  
Box 140  
Carrington, ND 58421

Div. of Cultural Programs  
National Park Service  
655 Parfet Street  
Denver, CO 80225

Chief, Interagency Arch.  
Services-Natl. Park Serv.  
655 Parfet St., Box 25287  
Denver, CO 80225

Asst. Sec. for Admin. & Mgmt.  
Director of Env. Affairs  
330 Independence Ave., SW  
Washington, D.C. 20207

Dept. of Health & Human Serv.  
Principal Reg. Official  
1961 Stout Street  
FOB, Room 11037  
Denver, CO 80294

Advisory Council on Historic  
Preservation  
1522 K Street NW  
Washington, D.C. 20005

Administrator  
HUD, Region VIII  
1405 Curtis Street  
Denver, CO 80202

Asst. Sec. for Prog. Policy  
U.S. Dept. of Interior  
ATTN: Office of Env. Proj. Rev.  
Washington, D.C. 20240

Regional Director  
U.S. Fish and Wildlife Service  
PO Box 25486, DFC  
Lakewood, CO 80225

Field Supervisor-Environment  
U.S. Fish and Wildlife Service  
1500 Capitol Avenue  
Bismarck, ND 58501

Bureau of Indian Affairs  
Federal Building  
Aberdeen, SD 57401

Bureau of Land Management  
Box 1072  
Dickinson, ND 58601

Chief, Intermountain Field  
Operations Center  
Bureau of Mines  
Bldg. 20, Denver Fed. Center  
Lakewood, CO 80225

Director  
National Park Service  
Rocky Mountain Region  
P.O. Box 25287  
Denver, CO 80225

Area Water Power  
Box 25046, Mail Stop 602  
Denver Federal Center  
Denver, CO 80225

Asst. Dir., Central Region  
U.S. Geological Survey  
MS101, Denver Federal Center  
Box 25406  
Denver, CO 80225

District Chief  
U.S. Geological Survey  
821 East Interstate Avenue  
Bismarck, ND 58501

NOAA, National Marine Fisheries  
Office of the Regional Director  
7600 Sand Point Way N.E.  
Bin C15700  
Seattle, WA 98115

U.S. Dept. of Transportation  
Federal Highway Admin.  
Federal Center, Bldg. 40  
P.O. Box 25246  
Denver, CO 80225

Commander (dcw)  
Second Coast Guard District  
1430 Olive Street  
St. Louis, MO 63103

State Hist. Pres. Officer  
State Hist. Soc. of ND  
ND Heritage Center  
Bismarck, ND 58505

N.D. Dept. of Agriculture  
State Capitol  
Bismarck, ND 58505

Department of Anthropology  
University of North Dakota  
Grand Forks, ND 58211

Attorney General's Office  
State Capitol  
Bismarck, ND 58505

North Midwest Regional Office  
Suite 920, Lumber Exchange Bldg.  
10 S. 5th St.  
Minneapolis, MN 55401

Suite 806  
1800 Kent St. North  
Arlington, VA 22207

North Central Reg. Vice Pres.  
Ducks Unlimited  
1535 S. 84th Street  
Omaha, NE 68124

The Waterways Journal  
666 Security Building  
319 North Fourth Street  
St. Louis, MO 63102

Institute for Ecological Studies  
Box 8278  
University Station  
Grand Forks, ND 58202

North Central Field Rep.  
Wildlife Management Inst.  
RR #1  
Firth, NE 68358

Environmental Defense Fund  
Inc.  
1525 18th Street NW  
Washington, D.C. 20036

National Wildlife Federation  
1412 Sixteenth Street, N.W.  
Washington, D.C. 20036

North Central Region  
Nat'l. Wildlife Federation  
710 2nd Street NW  
Mandan, ND 58554

North Central Plan. Council  
224 S.W. 4th Street  
Devils Lake, ND 58301

President  
North Dakota Wildlife Fed.  
Watford City, ND 58854

Chairman, Dakota Group  
Sierra Club  
PO Box 1624  
Rapid City, SD 57701

COLO. OFFICE  
First Floor-State Capitol  
Bismarck, ND 58505 ( )

North Dakota Indian Aff. Comm.  
Belcourt, ND 58316

Colorado State University  
Fort Collins, CO 80523

North Dakota Land Dept.  
State Capitol  
Bismarck, ND 58505

North Dakota State University  
Library  
ATTN: Documents Librarian  
Fargo, ND 58105

Energy Specialist  
Office of Energy Mgmt.  
1533 North 12th Street  
Bismarck, ND 58505

University of North Dakota  
Library  
ATTN: Documents Librarian  
Grand Forks, ND 58201

Dr. Robert Johnson, State  
Forester  
Dean, School of Forestry  
N.D. State Univ. - Bottineau  
Bottineau, ND 58318

Director  
N.D. State Planning Div.  
State Capitol  
Bismarck, ND 58505

Thermodsgard Law Library  
ATTN: Law Librarian  
School of Law, Room 161  
University of North Dakota  
Grand Forks, ND 58201

District Forester  
North Dakota Forest Service  
Bottineau, ND 58318

Reclamation Director  
Public Serv. Comm. of N.D.  
State Capitol  
Bismarck, ND 58505

Veterans Memorial Library  
520 Avenue A. East  
Bismarck, ND 58501

Commissioner  
N.D. Game & Fish Dept.  
2121 Lovett Avenue  
Bismarck, ND 58505

Executive Officer  
North Dakota Parks &  
Recreation Dept.  
P.O. Box 700  
Bismarck, N.D. 58502

North Dakota Geological Sur.  
University of North Dakota  
Grand Forks, ND 58201

Executive Secretary  
North Dakota Soil Cons. Comm.  
State Capitol  
Bismarck, ND 58505

Administrator  
ND Dept. of Health  
State Capitol  
Bismarck, ND 58505

Chief Engineer  
North Dakota Water Commission  
900 East Boulevard  
Bismarck, ND 58505

North Dakota Hwy Department  
State Highway Building  
Bismarck, ND 58505

Old West Regional Commission  
1823 W. Main  
Rapid City, SD 57701

State Historical Society  
North Dakota Heritage Cntr.  
Bismarck, ND 58505

Lake Agassiz Reg. Council  
Suite 205, South Plaza  
1621 South University Dr.  
Fargo, ND 58103

National Audubon Society  
North Midwest Regional Office  
Box 1591  
Jamestown, ND 58401

S Army Eng. Dist., Wilmington  
ATTN: SAWEP-PP/Mr. R. Phillips  
O Box 1890  
Wilmington, NC 28401

Division Engineer  
Fed. Hwy. Admn., U.S. DOT  
P.O. Box 1755  
Bismarck, ND 58501

Executive Director  
ND Indian Affairs Comm.  
Bottineau, ND 58318

Bureau of Land Management  
Box 940  
Miles City, MT 59301

Director  
Technical Services Division  
U.S. Dept. of HUD  
451 7th Street SW  
Washington, DC 20410

N.D. Outdoor Recreation  
Box 139, Route 2  
Mandan, ND 58554

Mr. Eric Wolfe  
Bureau of Land Management  
P.O. Box 729  
Cedar, Utah 84720

Director  
Architecture & Engrg. Div.  
FHA, U.S. HUD  
Washington, DC 20412

Nail Feist  
Velva, ND 58790

Administrator, Area 3  
BLM, USDI  
Federal Center, Bldg. No. 50  
Denver, Colorado 80202

Fed. Disaster Assistance Admn.  
25th Flr. Exec. Tower Bldg.  
1405 Curtis Street  
Denver, CO 80202

Soil Conservation Service  
Velva, ND 58790

Bureau of Reclamation  
P.O. Box 2553  
Billings, Montana 59103

Area Director  
FHA, U.S. Dept. of HUD  
P.O. Box 2483  
Fargo, ND 58102

North Dakota Water Users  
506 Midwest Federal Bldg.  
Minot, ND 58701

State & Private Forestry  
U.S. Forest Service  
370 Reed Road  
Broomall, PA 19008

Missouri Basin Region  
Office of the Sec'y. USDI  
Bld. 67-Denver Fed. Center  
Denver, Colorado 80225

Auditor  
Bottineau County  
Bottineau, ND 58318

Water Resources Activity  
Vector Biology & Control Div.  
Center for Disease Control  
Atlanta, GA 30333

Program Director, Columbia  
Fisheries Office  
811 NE Oregon, PO Box 4332  
Portland, Oregon 97208

Chairman, Board of County  
Commissioners, Bottineau  
Bottineau, ND 58318

Director  
Civil Defense, DOD  
Office of Civil Defense  
Washington, DC 20310

Chief, Bureau of Power  
Fed. Energy Reg. Comm.  
Washington, D.C. 20426

Mr. Roger Nelson, President  
Bottineau Chamber of Commerce  
Bottineau, North Dakota

Division of NEPA Affairs  
Department of Energy  
Mail Station E-201, GTN  
Washington, D.C. 20545

Governor Allen I. Olson  
State Capitol  
Bismarck, ND 58505

Highway Engineer  
Bottineau County  
Bottineau, ND 58318

Administrator, Fed. Hwy. Admin.  
Bridge Division HND 31  
400-7th Street SW  
Washington, DC 20590

Director, Public Affairs  
ND Farm Bureau  
1101 1st Avenue N  
Fargo, N. Dak. 58102

Bottineau County Water  
Management Board  
Kramer, ND 58748

President  
Village of Burlington  
Burlington, ND 58722

McHenry County Water Management  
Board  
Granville, ND 58741

Mr. James A. Rodacher  
County Tax Director  
Mohall, ND 58644

Carpio Public School District  
Carpio, ND 58725

Mr. Robert Laumb  
McKinney Township Sup.  
Tolley, ND 58787

Mayor  
City of Mohall  
Mohall, ND 58761

Mayor  
City of Carpio  
Carpio, ND 58725

Dr. Lowell Latimer  
Board of Education  
Minot, ND 58701

Auditor  
Renville County  
Mohall, ND 58761

President  
Village of Des Lacs  
Des Lacs, ND 58783

City Manager  
City of Minot  
Minot, ND 58701

Chairman, Board of County  
Commissioners, Renville Co.  
Mohall, ND 58761

Superintendent  
Granville Public School Dist.  
Granville, ND 58741

Assistant Minot City Engineer  
Minot, ND 58701

Highway Engineer  
Renville County  
Mohall, ND 58761

City Clerk  
City of Kenmare  
Kenmare, ND 58746

Finance Director  
City of Minot  
Minot, ND 58701

President  
Village of Sawyer  
Sawyer, ND 58781

Mayor  
ATTN: Auditor  
Kenmare, ND 58746

Mayor  
City of Minot  
Minot, ND 58701

President  
Village of Surrey  
Surrey, ND 58785

Auditor  
McHenry County  
Towner, ND 58788

Minot Park District  
Minot, ND 58701

President  
Village of Towner  
Towner, ND 58788

Highway Engineer  
McHenry County  
Towner, ND 58788

Minot City Planning Board  
Minot, ND 58701

Treasurer  
Village Towner  
Towner, ND 58788

Chairman, Board of County  
Commissioners, McHenry Co.  
Towner, ND 58788

City Clerk  
City of Mohall  
Mohall, ND 58761

Assessor  
City of Velva  
Velva, ND 58790

Dr. Gene Phillips  
Moorhead State University  
Moorhead, MN 56560

Division Engineer  
Chicago-NW Transportation Co.  
275 East Fourth St.  
St. Paul, MN 55101

Mr. Roger Richman  
Moorhead State University  
Moorhead, MN 56560

Vice President-Chief Eng.  
Chicago-NW Transportation Co.  
400 West Madison St.  
Chicago, IL 60606

Dr. Donald Scoby  
ND State University  
Fargo, ND 58701

Chairman, Zone 7, Com. on Water-  
way Proj. Assn. of American RR  
CRI & P Railroad  
La Salle Street Station  
Chicago, IL 60605

Dr. Bill Barker  
Natural Science Society  
ND State University  
Fargo ND 58854

Chief Engineer  
Chicago, RI, & Pacific RR  
La Salle Street Station  
Chicago, IL 60605

Mr. Mark Thornton  
IES  
University of ND  
Grand Forks, ND 58201

Division Engineer  
The Milwaukee Road  
Milwaukee Station  
Minneapolis, MN 55401

Dr. Gerry Van Amburg  
Concordia College  
Moorhead, ND 56560

Vice Pres.-Chief Engineer  
The Milwaukee Road, Union  
Station  
516 West Jackson Blvd.  
Chicago, IL 60606

Dr. Bernard Youngquist  
Supt., U of M Experiment Sta.  
Crookston, MN 56716

MN Railroads Association  
203 Hanover Bldg.  
480 Cedar St.  
St. Paul, MN 55101

Chief Engineer  
Soo Line Railroad Co.  
Soo Line Bldg.  
Minneapolis, MN 55402

Chief Engineer  
Burlington Northern Inc.  
176 East Fifth Street  
St. Paul, MN 55101

General Solicitor  
Western Railroad Assoc.  
222 S. Riverside Plaza  
Chicago, IL 60606

Manager, Engineering  
Burlington Northern Inc.  
547 W. Jackson Blvd.  
Chicago, IL 60606



Mr. Raymond Walter  
Karlsruhe, ND 58744

Mr. Robert G. Yos  
Sherwood, N. Dak. 58782

Birchwood Press  
P.O. Box 20055  
Denver, CO 80220

Mr. Gary Washek  
Rural Route 1  
Minot, ND 58701

Isadore Zimney  
Lansford, ND 58750

Bismarck Tribune  
Box 1498  
Bismarck, ND 58501

Ms. Alice Wetterman  
Mohall, N. Dak. 58761

Fargo Forum  
101 Fifth Street N.  
Fargo, ND 58101

Mr. Andrew Whereley  
Rural Route  
Tolley, ND 58787

Grant County Public Library  
P.O. Box 109  
Milbank, SD 57252

Grand Forks Herald  
Grand Forks, ND 58201

Mr. Harry Wilson  
Glen-Ewen, Sask. Canada

Madison Carnegie Public  
Library  
401 Sixth Street  
Madison, Minnesota 56256

Journal-Registry  
Velva, ND 58790

Mr. & Mrs. Willie Williams  
Rural Route  
Mohall, ND 58761

Circ. & Special Services  
Minot Public Library  
516 Second Avenue Southwest  
Minot, ND 58701

Minneapolis Star & Tribune  
425 Portland Avenue  
Minneapolis, MN 55415

Mr. Byron Wright  
Mohall, N. Dak. 58761

Morris Public Library  
102 East 6th Street  
Morris, Minnesota 56267

Minot Daily News  
Minot, ND 58701

Mr. Fred Yale  
Rural Route  
Mohall, ND 58761

Library  
N.D. Agricultural College  
Fargo, ND 58101

Mouse River Farmers Press  
Towner, ND 58788

Mr. Harold Yale, Jr.  
Rural Route  
Mohall, ND 58761

Sisseton Library  
Box 289  
Sisseton, SD 57262

Renville County Farmer  
Mohall, ND 58761

Mr. & Mrs. Roger Yale  
Tolley, N. Dak. 58787

University of Minnesota  
Rodney A. Briggs Library  
Morris, MN 56267

St. Paul Pioneer Press and  
Dispatch  
55 East Fourth St.  
St. Paul, MN 55101

Mr. Milton Stevens  
Burlington, ND 58722

Mr. Tony Swedlund  
Velva, ND 58790

Ms. Louise Vaagen  
Carpio, ND 56725

Ms. Violet Stewart  
Sherwood, ND 58782

Mr. Norman Swenson  
Tolley, ND 58787

Mr. M.D. Vanerstrom  
Carpio, ND 58725

Mr. Virgil Stewart  
Sherwood, ND 58782

Mr. Olaf. R. Tagestad  
townar, ND 58788

Mrs. Pauline A. Van  
Carpio, N. Dak. 567

Mr. Dennis Stoa  
Carpio, ND 56725

Ms. Ruby Tagestad  
townar, ND 58788

Mrs. Leo N. Vassar  
1530; ourth Avenue S  
Minot, ND 58701

Dr. Gerald Stordal  
15 Souris Court  
Minot, ND 58701

Mr. Verlan Tagestad  
Towner, ND 58788

Mr. Dale Vendsel  
Lansford, ND 58750

Mr. Donald C. Streitz  
Rural Route  
Foxholm ND 58738

Mr. Richard Thoms  
R.R. 6  
Minot, ND 58701

Ms. Esther Vendsel  
Lansford, ND 58750

Mr. Henry P. Sullivan  
Mohall, ND 58761

Dale & Peggy Thorenson  
Box 56  
Newburg, ND 58762

Leo & Janice Volk  
Sherwood, ND 58782

Mr. Embert Sveum  
Maxbass, ND 58760

Ms. Betty Thorp  
Carpio, ND 56725

Mr. R.E. Voight  
Soo Line Railroad  
Enderlin, ND 58027

Mr. Gordon Swenson  
Rural Route  
Tolley, ND 58787

Mr. Peter Thorp  
Carpio, ND 56725

Mr. Perry Walker  
Sherwood, ND 58782

Mr. Elwin Swift  
Carpio, N. Dak. 56725

Mr. Alvin Vaagen  
Carpio, ND 58725

Mr. Marvin Walks  
Foxholm, ND 58738

Mr. Larry Roggenbuck  
Carpio, N. Dak. 56725

Lynn Schipp  
Box 81  
Newburg, ND 58762

Ms. Louise W. Siebert  
Tolley, ND 58787

Mr. Vernon Rom  
Denbigh, ND 58732

Ms. Patricia Schmidt  
Rural Route  
Burlington, ND 58722

Billy Siercks  
Lanela, ND 58749

Mr. Harlon Rostod  
Carpio, ND 56725

Mr. Emil Schock  
Voltaire, ND 58792

Ms. Ruth Skaufel  
Carpio, ND 56725

John Royer  
Winacre Drive  
Lafayette, NY 13084

Mr. Willis Schultz  
Carpio, ND 56725

Mr. L.R. Smith  
Rural Route  
Sherwood, ND 58782

Mr. Paul Satterlund  
Carpio, N. Dak. 56725

Mr. David Schupp  
Norma, ND 58766

Mr. Willis Smith  
Sherwood, ND 58782

Mr. Harold Sauer  
Glenburn, ND 58740

Mr. Ves Schuster  
2914 Second Ave. SW  
Minot, ND 58701

Mr. John Soderquist  
Columbus, ND 58727

Mr. Richard Sauer  
Carpio, ND 56725

Mr. Myron Sebastian  
Towner, ND 58788

Clair Southam  
Mohall, ND 58644

Mr. Stanley Saugstad  
Route 4  
Minot, ND 58701

Mr. Laurence Servold  
Tolley, ND 58787

Henry and Mary Stammer  
RR 6  
Minot, ND 58701

Mr. Lawrence Scheresky  
Des Lacs, ND 58733

Mr. Charlie Shong  
Mohall, ND 58761

Mr. Reuben Steffan  
2019 Second Ave. SW  
Minto, ND 58701

Mr. Martin Schiffman  
Sherwood, ND 58782

Mr. Lester Siebert  
Rural Route  
Tolley, ND 58787

Mr. Leo Stammen  
Burlington, ND 58722

Mr. Kenneth Niewohner  
Deering, ND 58731

Mr. & Mrs. Harry Ostlund  
Tolley, ND 58787

Mr. A.J. Picotte  
Carpio, N. Dak. 567

Mr. Lloyd Nygard  
Route 6  
Minot, ND 58701

Ms. Jany Overton  
Norma, ND 58766

Mr. Harold Piper  
1508 Third Avenue S  
Minot, ND 58701

Mr. John Odland  
Kenmare, ND 58746

Mr. Gary L. Pearson  
Route 2  
Jamestown, ND 58401

Messrs. John & Dick  
Foxholm, ND 58738

Mr. & Mrs. C. L. O'Keefe  
Lansford, ND 58750

Mr. Don Perkuchin  
Box 12  
Foxholm, ND 58738

Mr. Donald Rademach  
Foxholm, ND 58738

Mr. Lawrence Olesen  
Sherwood, ND 58782

Mr. Dallas Perron  
Sherwood, ND 58782

Mr. Frank Rademach  
Rural Route  
Foxholm, ND 58738

Mr. James W. Olson  
Velva, ND 58790

Mrs. Fannie F. Peters  
Towner, N. Dak. 58788

Mr. Gene Ramsdell  
Kenmare, ND 58746

Mr. Sidney Olson  
Rural Route  
Mohall, ND 58761

Mr. S.E. Peterson  
1916 Seventh St. NW  
Minot, ND 58701

Miss Barbara Rebor  
1149 SW Davenport  
Portland, OR 9720

Ms. JoAnne Ones  
Tolley, ND 58787

Mr. Donald Peterson  
Berthold, ND 58718

Ms. Dorothy Reinart  
Rural Route  
Minot, ND 58701

Mrs. Chris Ones  
Rural Route  
Tolley, ND 58787

Mr. Donald D. Peterson  
Carpio, N. Dak. 56725

Mr. R.E. Reinke  
Route 4  
Minot, ND 58701

Mr. Curtis Ones  
Tolley, ND 58787

Mr. Kenneth Pfiffner  
119 Sixth St. NW  
Minot, ND 58701

Mr. Duane Roen  
Lansford, ND 58750

Hon. Richard Lokken  
13 Delmar Drive  
Minot, ND 58701

Mr. Gil Melland  
Kenmare, ND 58746

Mr. Marvin Murphy  
Donnybrook, ND 58734

Mr. Glenn E. Long  
Bottineau, ND 58318

Mrs. Jack Miller  
Lansford, ND 58750

Mr. Richard Musch  
Burlington, ND 58722

Mr. John McCanna  
7020 Kellogg Ave. S.  
Edina, MN 55434

Mr. John E. Miller  
Box 427  
Towner, ND 58788

Mr. Donald Myers  
Rt. #6  
Minot, N. Dak. 58701

Mr. E.C. McCarroll  
Tolley, ND 58787

Mr. Kyle Miller  
Bantry, ND 58713

Mr. Lowell Myers  
Carpio, ND 56725

Ms. Genevieve McDermott  
Sherwood, ND 58782

Mr. Norman Moen  
Granville, ND 58741

Mr. Clifford L. Nelson  
Sherwood, ND 58782

Mr. Howard McGuire  
Carpio, ND 56725

Mr. Dick Morton  
Carpio, ND 56725

Mr. Farrel Nelson  
Towner, ND 58788

Mr. O.L. McNea  
813 NW 21st  
Minot, ND 58701

Ms. Elsie Mott  
Sherwood, ND 58782

Mr. Laurence Nelson  
Denbigh, ND 58732

Mr. Erling Markusen  
Denbigh, ND 58732

Mr. Ernest Mott  
Sherwood, ND 58782

Mr. & Mrs. Nelson  
Denbigh, ND 58732

Mr. Lynn Martin  
Route 2  
Minot, ND 58701

Mr. A.R. Moun  
Box 1458  
Bismarck, ND 58501

Mr. Stan Nelson  
R.R. 6  
Minot, ND 58701

Mr. Dennis G. Mattern  
Rural Route  
Mohall, ND 58761

Mrs. James Munt  
Mouse River Park  
Tolley, ND 58787

Mr. Lyle Newhouse  
Sherwood, ND 58782

Mr. Joseph Keller  
Coast to Coast Store  
Velva, ND 58790

Mr. W.F. Kosel  
Sherwood, ND 58782

Mr. Harold I Leav  
402 Second Avenue  
Mohall, ND 58761

Mr. Joe Kennedy  
Foxholm, ND 58738

Mr. Alvin A. Kramer  
1205 13th Street  
Minot, ND 58701

Mr. Art Lee  
Carpio, ND 56725

Mr. Donald Keyes  
Nine Little Ponderosa  
Minot, ND 58701

Ms. Anna L. Krenz  
P.O. Box 293  
Mohall, ND 58761

Mr. Don Lee  
Carpio, N. Dak. 5

Mr. Albert Klain  
Turtle Lake, ND 58575

Mrs. Paul Krenz  
Sherwood, ND 58782

Mrs. Dorothy Lee  
Carpio, N. Dak. 5

Mr. Glen D. Klebe  
236 Souris Drive  
Minot, ND 58701

Mr. Craig Kuth  
Sherwood, ND 58782

Mr. Ole J. Lee  
Rural Route  
Carpio, ND 58725

Mr. Vernon Knogslie  
Denbigh, ND 58732

Mr. Roy Laframboise  
Towner, ND 58788

Mr. Gary Lenton  
Norwich, ND 58768

Mr. H. Knudsen  
325 11th Street NW  
Minot, ND 58701

Mr. Ervin Lakelfield  
Sherwood, ND 58782

Mr. Gordon H. Lewi  
Carpio, N. Dak. 5

Mr. Alvin Knutson  
Rural Route  
Sherwood, ND 58782

Mr. Gilmore V. Landis  
230 Souris Drive  
Minot, ND 58701

Mr. Ken Livedalen  
Towner, ND 58788

Mr. & Mrs. John Knutson  
Sherwood, ND 58782

Mr. Laurets Larson  
Denbigh, ND 58732

Mr. Allan Livingst  
Kenmare, ND 58746

Mr. Marvin Knutson  
401 Second Avenue  
Mohall, ND 58761

Ms. Myrtle C. Larson  
2009 West Central  
Minot, ND 58701

Mr. Carl Loftesnes  
Velva Lumber Comp  
Velva, ND 58790

Mr. A. J. Hefter  
Sherwood, ND 58782

Mr. Earnest Hoelscher  
Rural Route  
Foxholm, ND 58701

L. Wilbur & Lois L. Johnson  
RR 1  
Mohall, ND 58761

Mr. Bruce Helseth  
NDFU  
Carpio, ND 58725

Mr. Charles Hoffman  
844 10th Ave. NW  
Minot, ND 58701

Mr. & Mrs. Lloyd Johnson  
Sherwood, ND 58782

Mr. Darrell S. Helseth  
Carpio, ND 56725

Mr. James Hombier  
Tolley, ND 58787

Nora Johnson  
Box 563  
Mohall, ND 58761

Mr. Bryce Henderson  
Sherwood, ND 58782

Mr. Vince Horner  
Upper Souris Water  
Mohall, ND 58644

Palmo Johnson  
Route 1  
Mohall, ND 58761

Mr. Quentin Hennenfent  
820 16th Ave. SW  
Minot, ND 58701

Mr. Valdmor Hovde  
707 SW 12th  
Minot, ND 58701

Mr. Paul Johnson  
Carpio, N. Dak. 56725

Mr. Art Harther  
240 Souris Drive  
Minot, ND 58701

Mr. Clayton Howe  
Valva, ND 58790

Dr. Richard W. Johnson  
208 Souris Drive  
Minot, ND 58701

Mr. Carl J. Herzig  
Rural Route  
Burlington, ND 58722

Mrs. Helen Howe  
Veva, ND 58790

Mr. & Mrs. Richard Johnson  
Tolley, ND 58787

Mr. Floyd Herzig  
Rural Route  
Burlington, ND 58722

Mrs. Shirley K. Hunt  
5600 Hillside Court  
Minneapolis, MN 55435

Mr. Thor Johnson  
Number 9 Greenway  
Minot, ND 58701

Mr. Lloyd Hausers  
110 Sencond Avenue SE  
Minot, ND 58701

Mr. Bob Inman  
Kemmere, ND 58746

Mr. Vincent W. Johnson  
Route 4  
Minot, ND 58701

Mr. Mark Hinthorne  
Souris Basin Planning Council  
Minot, ND 58701

Mr. Kenneth L. Johnson  
Burlington, ND 58722

Mr. Dale Keith  
Sherwood, ND 58782

Mr. Roger Foss  
Sherwood, ND 58782

Mr. Oscar Gilbertson  
Rural Route  
Sherwood, ND 58782

Dr. M. Byron Grubb  
600 17th Ave. SE  
Box 1489  
Minot, ND 58701

Mr. Thore Fossum  
628 24th Ave. NW  
Minot, ND 58701

Mr. Walter Gillstad  
Voltaire, ND 58792

Mr. Mike Gugoire  
Donnybrook, ND 58734

Mr. Glen Froseth  
Kenmare, ND 58746

Mr. Norman Gjellstad  
Valva, ND 58790

Conrad Haarsager  
Mohall, ND 58761

Mr. Donovan Funke  
Greene  
Tolley, ND 58787

Robert Gjellstad  
RR 1 Box 90  
Voltaire, ND 58792

David B. Hall  
Newburg, ND 58762

Norwin L. Fylling  
421 East 5th St.  
Bottineau, ND 58318

Mr. George Gorde  
Foxholm, ND 58738

Ms. Diane Halverson  
Route 1  
Northfield, MN 55057

Dr. and Mrs. Gamme  
Kenmare, ND 58746

Mr. Burton Graff  
Carpio, ND 56725

Mr. Orlin Hanson  
Sherwood, ND 58782

Mr. Michael Gates  
Lansford, ND 58750

Mr. Dale Graff  
Carpio, ND 56725

Mr. Robert S. Hanson  
Sherwood, ND 58782

Mr. David Gilbertson  
Sherwood, ND 58782

Mr. and Mrs. Reuben Gravseth  
Souris, ND 58783

Mr. Aibreya Harkness  
Sherwood, ND 58782

Mr. Elmer Gilbertson  
Rural Route  
Sherwood, ND 58782

Mr. David Gray  
Carpio, ND 56725

Mr. & Mrs. Elmer Harkness  
Sherwood, ND 58782

Mr. Norman Gilbertson  
Sherwood, ND 58782

Mr. Orland Grove  
Denbigh, ND 58732

Mr. Larry Hauser  
Foxholm, ND 58738



Mr. Byron Duerre  
Norman, ND 58766

Mr. Doyle Emmel  
Sherwood, ND 58782

Ms. Lillian Espeseth  
Denbigh, ND 58732

Messrs. Ben and Don Eckert  
Foxholm, ND 58738

Mr. Herbert Emmel  
Kenmare, ND 58746

Mr. Myron Espeseth  
Denbigh, ND 58732

Mr. Fred Ehr  
North Burlington Road  
Minot, ND 58701

Mr. Larry Emmel  
Renville, ND 58787

Dr. Larry Falk  
Moorhead State University  
Moorhead, MN 56560

Douglas Eiken  
State Parks and Recreation  
Rt. 2, Box 139  
Mandan, ND 58554

Ms. Nancy Emmel  
Sherwood, ND 58782

Mr. Curtis Feist  
Velva, ND 58790

Mr. Lowell Elberg  
Carpio, ND 58725

Mr. Allan Engl  
Sherwood, ND 58782

Mr. Robert Fields  
Upham, ND 58789

Mr. Evan Elnestad  
Foxholm, ND 58738

Mr. Willard Erdman  
2800 Ninth Ave. SE  
Minot, ND 58701

Ora Fischer  
Mohall, ND 58761

Ms. Agnes Elvestad  
Foxholm, ND 58738

Mr. Alan Erickson  
Carpio, N. Dak. 56725

Mr. & Mrs. Harry Flaherty  
Berthold, ND 58718

Mr. Steve Emerson  
Rural Route  
Mohall, ND 58761

Mr. Clifford Erickson  
Carpio, ND 56725

Mr. Harlen Flaten  
Carpio, N. Dak. 56725

Mrs. JoAnn Emmel  
Sherwood, ND 58782

Mr. LaVerne Erickson  
Mohall, ND 58701

Mr. H.E. Follman  
Towner, N. Dak. 58788

Mr. Dennis R. Emmel  
Sherwood, ND 58782

Ms. Joyce Ann Espeseth  
Denbigh, ND 58732

Mr. Ivan Foss  
Sherwood, ND 58782

Mrs. David Bowe  
209 Linden Avenue South  
Fargo, ND 58102

Mr. Jacob E. Carlson  
Rural Route  
Lansford, ND 58750

Mr. M. O. Dahle  
Box 1796  
Minot, ND 58701

Mr. Ewald S. Braun  
Foxholm, ND 58738

Mr. Vernon Carlson  
Glenburn, ND 58740

Mr. Clifford Dahlseng  
Carpio, ND 58725

Mr. Herman Braun  
Foxholm, ND 58738

Mr. Lee D. Christensen  
Kenmare, ND 58746

Mr. Warren Dailey  
Sherwood, ND 58782

Mr. Perry Braun  
Sherwood, ND 58782

Mr. John Clouse  
Rural Route  
Foxholm, ND 58738

Mr. C. R. Danks  
Route 2  
King's Court  
Minot, ND 58701

Dr. A. B. Brudirk  
D.D.S. Office  
Mohall, ND 58761

Mrs. Veronica Clouse  
Rural Route  
Foxholm, ND 58701

Mr. Eugene G. Davidson  
Tolley, ND 58787

Mr. Clifford Burbidge  
Mohall, ND 58761

Mr. Eldon J. Cook  
Norman, ND 58766

Mr. Godfrey G. Davids  
Tolley, ND 58787

Mr. Paul Burgess  
Velva, ND 58790

Dr. V.A. Corbett  
Minot, ND 58701

Mr. and Mrs. Donald D  
Rural Route  
Foxholm, ND 58738

Mr. Leland Burtness  
1932 1st Ave. SW  
Minot, ND 58701

Mr. Howard Coss  
Towner, ND 58788

Mr. & Mrs. Des Laurie  
Sherwood, ND 58782

L. J. Buzzell  
1704 1st Ave. SW  
Minot, ND 58701

Mr. Kenneth D. Crites  
2036 California Drive  
Minot, ND 58701

Dr. Dennis Disrud  
413 Hillcrest Drive  
Minot, ND 58701

Mr. Edward Cantlon  
Balfour, ND 58712

Mr. Al J. Cutz  
Antler, ND 58711

Mr. Duane Dokken  
1021 NW Eighth  
Minot, ND 58701

Mrs. Erma Aalund  
P.O. Box 572  
Mohall, ND 58761

Mr. Roy Axness  
Carpio, ND 56725

Mr. John A. Berueseh  
Denbigh, ND 58732

Bruce C. Adams  
2510 Bel Air Court  
Minot, ND 58701

Mr. Harold Bader  
13 Souris Court  
Minot, ND 58701

Mr. Walley Beyer  
Velva, ND 58790

Mark & Julie Adams  
RR 2  
Lansford, North Dakota 58750

Mrs. John Bahn  
Foxholm ND 58738

Mr. Donald Bivins  
Sawyer, ND 53781

Mr. Ray Albers  
Rural Route  
Foxholm, ND 58738

Carrol Bakken  
Voltaire, ND 58792

Mr. Daniel Bloms  
Foxholm, ND 58738

Mr. Harold E. Anderson  
Velva, ND 58790

Mr. Michael Bauer  
Rural Route  
Tolley, ND 58787

Mr. Ralph Bloms  
Rural Route  
Lansford, ND 58750

Mr. Harvey Anderson  
Carpio, ND 56725

Mr. Richard A. Beall  
Velva, ND 58790

Mr. Donald Boll  
Newburg, ND 58762

Mr. Dan Arnold  
Carpio, N. Dak. 56725

Mr. Leon Becker  
Des Lacs, ND 58733

Raymond Boll  
Newburg, ND 58762

Mr. Stephen Ashley  
Velva, ND 58790

Ms. Helene Benson  
Sherwood, ND 58782

Mr. Glen Bonness  
Rural Route  
Minot, ND 58701

Mr. Thomas Assels, Sr.  
Hi-Rise  
Minot, ND 58701

Mr. Don Berge  
Velva, ND 58790

Mr. Kenneth Booth  
Towner, ND 58788

Mr. Marvin Axness  
Carpio, N. Dak. 56725

Mr. Donovan Bertuk  
Bottineau, ND 58318

Mr. Milo Borstad  
Route 2  
Minot, ND 58701

Velva Journal  
Velva, ND 58790

Postmaster  
Kenmare, ND 58746

Dr. Duane Dahlberg  
Concordia College  
Moorhead, ND 56560

Water Control News  
325 Peterson Avenue West  
Minot, ND 58701

Postmaster  
Minot, MN 58701

Dr. Leonard B. Dworsky  
Water Resources Center  
Cornell University  
468 Hollister Hall  
Ithaca, NY 14850

Postmaster  
Mohall, ND 58761

Professor John C. Green  
University of MN-Duluth  
229 Science & Math Bldg.  
Duluth, MN 55812

KCJB Radio  
Minot, ND 58701

Postmaster  
Sawyer, ND 58781

Guilford O. Fossum, Ph.D.  
Department of Civil Engineering  
University of North Dakota  
Grand Forks, ND 58202

KLPM Radio  
Minot, ND 58701

Postmaster  
Surrey, ND 58785

Dr. Del Helgeson  
ND State University  
Fargo, ND 58701

KMOT-TV  
Minot, ND 58701

Postmaster  
Towner, ND 58788

Yung-Tse Hung, Ph.D.  
Assistant Professor of  
Engineering  
University of North Dakota  
Grand Forks, ND 58202

KXMC-TV  
Minot, ND 58701

North Dakota Academy of  
Science  
University of North Dakota  
Grand Forks, ND 58202

Dr. Mary Bromel  
ND State University  
Fargo, ND 58701

Dr. Paul Leiby  
Division of Science  
Minot State College  
Minot, ND 58701

Postmaster  
Burlington, ND 58722

Dr. J. Frank Cassel  
ND State University  
Fargo, ND 58701

Mr. Peter H. Lindert  
Dept. of Economics, University of  
Social Science Bldg.  
Madison, WI 53706

Postmaster  
Des Lacs, ND 58733

Center for Environmental  
Studies, Bemidji State  
University  
Bemidji, MN 56601

Dr. Richard Pemble  
Moorhead State University  
Moorhead, MN 56560

Commissioners  
City of Velva  
Velva, ND 58790

Miss Valeria Howard  
President, ENPRO  
Box 1036  
Jamestown, ND 58401

Mr. Martin Clausen  
McKinney Cemetery  
Norman, ND 58766

President  
City of Velva  
Velva, ND 58790

Mr. Robert E. Stein  
Environmental Mediation Intl.  
2033 M St. NW, Suite 801/802  
Washington, DC 20036

C. S. McCrossan, Inc.  
P.O. Box A-D  
Osseo, MN 55369

Velva Park Board  
Velva, ND 58790

R.J. Lemay  
Research Analyst  
Evinrude Motors  
Milwaukee, WI 53216

Minot Retriever Club  
Minot, ND 58701

Velva School Board  
Velva, ND 58790

Mr. Daroll Thompson  
Fire Protection D  
Sherwood, ND 58782

Natl. Assn. Of River and  
Harbor Contractors  
536 Washington Bldg.  
15th and New York Ave.  
Washington, DC 20005

Mr. Arnold Hanson, Chairman  
Walsh County Park Board  
Grafton, ND 58237

Harrington Ranch, Units 1 & 3  
Rural Route 1  
Minot, ND 58701

Mr. Stephen M. Olko  
Olko Engineering  
500 Fifth Avenue  
New York, NY 10036

Mr. Walter Rast  
Intl. Joint Commission  
1717 H St. NW, Room 203  
Washington, DC 20440

Outboard Boating Club of  
America  
401 N. Michigan Ave.  
Chicago, IL 60611

President, AFL-CIO  
815 Sixteenth St. NW  
Washington, DC 20006

C.R. Kaller  
Kaller & Raymo  
411 Sinclair Street  
Bottineau, ND 58318

River & Harbor Imp. Assn.  
218 West Becher St.  
Milwaukee, WI 53207

Regional Office  
AFL-CIO  
175 Aurora Ave  
St. Paul, MN 55103

President  
ND League of Women voters  
1625 S. 14 1/2 Street  
Fargo, ND 58102

Chairman  
Rush River Water Management  
Board  
Cass County Court House  
Fargo, ND 58102  
Director, Gov't. & Public Aff  
St. Paul Area Chamber of Comm  
300 Osborn Bldg.  
St. Paul, MN 55102

Midwestern Regional Rep.  
American Waterways  
Operators Inc.  
11 S. Meramec Ave-Suite 1312  
St. Louis, MO 63105

President  
MN League of Women Voters  
555 Wabasha St.  
St. Paul, MN 55102

Dames & Moore  
ATTN: Library  
1100 Glendon Ave., Suite 1000  
Los Angeles, CA 90024

Mr. Gary Nelson  
Limnetics Inc.  
6132 W. Fond Du Lac Ave.  
Milwaukee, Wis. 53211

Mr. Chuck Peck  
J. Clark Salyer National  
Wildlife Refuge  
Upham, ND 58789

Mr. Jon Malcolm  
J. Clark Salyer National  
Wildlife Refuge  
Upham, ND 58789

Lucy Hilgendorf  
The Western Network  
1700 Paseo de Peralta  
Santa Fe, NM 87501

Sierra Club  
210 Ramar Bldg.  
111 E. Franklin, MN  
Minneapolis, MN 55404

Coordinator  
Souris River Basin Report  
Box 1933  
Minot, ND 58701

Power Supply Division  
Southern Engineering Co.  
1000 Crescent Ave. NE  
Atlanta, GA 30309

Laverne C. Kreft  
Vice President  
State Bank of Towner  
Towner, ND 58788

Water Resources Congress  
Suite 1101  
955 L'Enfant Plaza N. SW  
Washington, DC 20036

Watne Realtors, Inc.  
408 North Broadway  
Minot, ND 58701

Northcentral Field Rep.  
Wildlife Management Institute  
Route 2  
Fargo, ND 58102

Mr. Mike Reynolds  
Wisconsin Canoe Association  
9021 F 91st Street  
Milwaukee, WI 53224

Bismarck Chapter  
Izaak Walton League  
P.O. Box 15555  
Bismarck, ND 58501

EXHIBIT 5

Letters of Comment and Corps Responses

The response in this section address only the comments on the Velva site-specific EIS. Responses to comments on the Lake Darling programmatic EIS are in the comment/response section of that document.



## DETAILED COMMENTS

### Draft Programmatic EIS

We believe the overview or programmatic EIS should place the components of the plan in the perspective of the flooding problems of the area and the environmental and economic costs of solving them. We realize that many specific aspects of the Lake Darling portion of the plan will be addressed in the site specific EIS to be prepared subsequent to the programmatic review. However, the draft programmatic EIS should address questions concerning the overall level of flood protection that is expected from the program, what additional or alternative measures might be required if further reductions in flood damages are needed as well as an indication of who will be responsible for implementing them. We feel the EIS should also provide a better understanding of the expected feasibility of the individual projects and the program as a whole. The draft programmatic EIS and the scoping activities the Corps has already undertaken have helped to identify many of the essential questions to be addressed in the site specific analysis. The final EIS can address the general issues and identify specific issues that will be dealt with in greater detail in the site specific EIS.

Thus, we feel the principal areas of the draft programmatic EIS needing improvement are its description of the contributions of the various components of the plan to reductions in flood damages, possible alternatives to the proposed plan, and an overview of the financial aspects of the projects (including an overview of the costs, benefits, and distribution of costs among the various local communities served by the program). We believe that these aspects of the overall plan are ripe for disclosure, public discussion, and decision at the present stage of program planning.

### Velva Site Specific EIS

We believe the EIS on the Velva portion of the flood control program would be improved by a more complete discussion of its relationship to the overall flood control program, and more descriptive information on the alternatives that were eliminated from detailed study during the planning process. Although indirect impacts of the levees on development in the protected floodplain are well analyzed in the EIS, the indirect effects of the project on higher upstream flood stages should be described in more detail. Indirect effects of the project on the hydrologic regimes of the wetlands and floodplain forests that will remain behind the levees should also be addressed.

## Corps Responses to the U.S. Environmental Protection Agency

### 1. Velva Site-Specific EIS

- a. Relationship of Velva to the overall flood control program. We have expanded the general discussion of the relationship between the Velva features and the overall flood control project in section 2.00. We have also presented more detail in the discussion of the amount of protection that would be provided without the Lake Darling features (paragraph 4.16), of project economic relationships (4.21), and of project financial responsibilities (paragraph 6.26).
- b. More descriptive information on alternatives. The alternatives mentioned were not studied in sufficient detail to allow adequate presentation in this EIS. Paragraph 4.02 has been revised to explain why these alternatives were not studied in detail.
- c. Indirect effects on higher upstream flood stages. Higher upstream flood stages would have no significant impact because of their low frequency and duration. Subparagraph 6.23-a. now clarifies this point.
- d. Indirect effects on wetlands and floodplain forests behind the levee. Since no substantial change would occur in the hydrologic regimes of these areas, no significant impact on wetlands or floodplain forests behind the levees is anticipated. Paragraph 6.19 presents more detail on the analysis of effects on an oxbow wetland that would be isolated by the levee.

We are pleased with the proposed mitigation plans for wetlands and floodplains. We encourage your agency to continue your pursuit of these measures through the implementation stages of the project. We also encourage you to consider further measures aimed at preventing drainage of wetlands and restoring previously drained wetlands as additional mitigation where they are appropriate. The relationship between wetlands drainage, degraded water quality, and increases in flooding is too strong to be considered anything less than a cornerstone of efforts to reduce flood damages in the Souris River drainage.

Preliminary Section 404 (b)(1) Evaluation

The sections of the evaluation that address Effects on Special Aquatic Sites and Determination of Secondary Effects on Aquatic Ecosystems (Sections E(5) and H, respectively) do not address the effects of the project will have on wetlands cut off from the river by the levees. We believe these impacts should be considered.

In the Executive Order 11990 evaluation on page 46, three mitigation measures that were considered and rejected are identified. We believe the document should include a brief explanation of the reasons these measures were considered impractical.

Corps Responses to the U.S. Environmental Protection Agency (cont.)

2. 404(b)(1) evaluation consideration of impacts on wetlands behind the levee: These effects were considered and determined to be not significant (see response 1.d.). The 404(b)(1) evaluation (section II.B.2.a. and II.E.3.) has been revised to present more detail on this analysis.

3. Reasons for elimination of three mitigation measures: These reasons have been added to the EO 11990 analysis in exhibit 2.

UNITED STATES DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

FEDERAL BUILDING  
P.O. BOX 7162  
MISSOULA, MONTANA 59807

3520

DEC 27 1982



Edward G. Rapp, Colonel  
ATTN: NCSPD-ER  
Department of the Army  
Corps of Engineers, St. Paul District  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

Dear Colonel Rapp:

The following are comments on the Draft Programmatic Environmental Impact Statement for the Lake Darling and Velva Flood Control Projects in North Dakota.

Lake Darling Project

1. As stated on page 9, forests along the Souris River in North Dakota represent about 2 percent of the State's total forest. While the acreage is not large compared to crop and pasture land, forest land is, in many cases, the vital link in the survival of a number of wildlife species. Therefore, from a wildlife standpoint, any reduction in native forest land along the Souris River and tributaries will be detrimental to wildlife.
2. By increasing the size of the conservation and flood pools, existing forest land will be inundated all or parts of each year. Year-round or frequent inundation will kill most tree species. Periodic inundation will eliminate some of the existing tree species, thereby reducing the forest land species diversity and degrading the general wildlife habitat.
3. Increased downstream flood protection, as a result of the modifications of Lake Darling, will hasten the clearing of native forest land for additional crop and pasture land. This will further deteriorate the wildlife habitat associated with forest land.
4. Water quality in the lake would, most likely, deteriorate resulting from increased sediments from lakeshore erosion. Wave activity would probably increase corresponding to the increase in the size of the lake.
5. We recommend that any native forest land losses be mitigated on a 2:1 basis (two multi-row acres planted for every native forested acre lost).


Velva Flood Control Project

1. The selected plan is acceptable.

Edward G. Rapp, Colonel

2

2. There will be a direct loss of 14 acres of native forest land under the selected plan. We believe this should be mitigated at a rate of two planted multi-row acres for every acre of native forest land lost by the project (similar to U.S. Fish and Wildlife Service and North Dakota Game and Fish Department recommendations). As stated on page 49, the C.O.E. estimates that only five acres are available for revegetation. Therefore, we recommend additional lands be acquired for mitigation of these forest land losses up to 28 acres and planted to a variety of tree species.

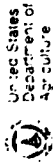


TOM COSTON

for Regional Forester

Corps Responses to the U.S. Department of Agriculture, Forest Service

1. As a result of this comment and the recent availability of more detailed project plans, an analysis of vegetation losses and mitigation requirements was conducted. This analysis determined that net vegetation losses would be only 3.5 acres and concluded that this loss was not significant (see paragraphs 4.27-4.30).



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

P. O. Box 1458  
Bismarck, ND  
58502

December 8, 1982

File Code: 190-15-13-5

Colonel Edward G. Rapp  
District Engineer  
Corps of Engineers/St. Paul District  
Department of the Army  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

The Soil Conservation Service has reviewed the Draft Programmatic Environmental Impact Statement (EIS) for the Lake Darling Flood Control Project and the Draft Feature Environmental Impact Statement for Velsa Flood Control Project and Lake Darling Flood Control Project. We have the following comments:

Draft Programmatic EIS:

1. As stated on Page 10, Paragraph 4.21; Page 17, Paragraph 5.21; and Page 23, Paragraph 7.09; quantification and effects of potential impacts on prime farmlands will need to be assessed definitively in the site-specifically Lake Darling EIS.
2. Page 19, Paragraph 5.33, Line 6 -- "diciuous" should be spelled "deciduous".

Draft Feature EIS:

1. Prime farmland appears to be adequately addressed in this draft.

We appreciate the opportunity to comment.

Sincerely,

*Michael E. McNamee*  
Michael E. McNamee  
State Conservationist

cc:  
Peter C. Myers, Chief, SCS, Washington, D.C.



United States Department of the Interior

OFFICE OF THE SECRETARY  
OFFICE OF ENVIRONMENTAL PROJECT REVIEW

Room 688, Building 67  
Denver Federal Center  
Denver, Colorado 80225

IN REPLY  
REFER TO:

ER 82/1803

DEC 22 1982

Colonel Edward G. Rapp  
District Engineer  
U.S. Army Engineer District, St. Paul  
1135 U.S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We have reviewed the Draft Environmental Statement for Lake Darling Flood Control Project, Renville, Ward, McHenry, and Bottineau Counties, North Dakota, and have the following comments.

Draft Programmatic Environmental Impact Statement (EIS)

Fish and Wildlife Resources

Paragraph 3.08 - A levee to protect the cemetery would likely be located partly or wholly on National Wildlife Refuge (NWR) lands. The levee would require some removal of woody vegetation and may involve some wetland filling.

Paragraph 3.09, No. 4 - The option of levee protection and construction of a channel cutoff also would require use of NWR lands. The possibility of a land exchange with Renville County, or other types of land interest arrangements will be explored if this option is chosen.

Paragraph 3.10 - In connection with protection of the Eckert Ranch, consideration should be given to rerouting drainage from this area, or undertaking other measures to reduce the feedlot runoff problem into the lake at this location. Such pollution abatement could be an important measure to offset project-induced water-quality problems in Lake Darling and the Souris River.

Paragraph 3.15 - Potential modifications of the J. Clark Salyer water control facilities may include raising the embankments to increase pool storage capacities. Such increased storage may be a necessary component of compensation for reduced water management capabilities caused by prolonged high flows from the project.

Paragraph 4.09 - The water quality discussion in this paragraph does not reflect that the largest point source, the Minot Sewage Treatment Plant, has been one of the last to upgrade facilities. Sewage discharges from this source have been a continuing problem. The large extent of wetland drainage and channelization in the basin also offsets advances made to date in municipal waste treatment.

Paragraph 5.11 - The downstream reaches of the Souris River are subject to periodic winterkill, because of low flows and water quality problems. Fish from Lake Darling constitute the principal source for repopulating downstream reaches following these events.

#### Historical Resources

Page 18 - It is stated that acquisition of the Eckert Ranch could have an adverse effect on the Parker Log House, which is potentially eligible for the National Register of Historic Places. We were unable to locate the Eckert Ranch from the information provided in the draft statement, and would like to see a map or other information provided in the final statement which would pinpoint the location of the Eckert Ranch and the Parker Log House.

The final statement also should clarify the extent of the impacts which can be expected from work to be done at Fish and Wildlife Dam No. 41, and Pools A and B below Lake Darling Dam, and the raising of the Soo Line Railroad and Highway 28 bridges. It appears from the information provided, that some impacts on archeological sites can be expected, but the nature of those impacts is not discussed. Appropriate mitigation measures for historical sites also should be discussed in the final statement, and evidence presented showing the concurrence to those mitigation measures by the State Historic Preservation Officer.

#### Agricultural Resources

Paragraph 4.20 and 5.19 - It should be stated in these two sections whether the agricultural lands are considered prime farmlands by the Department of Agriculture.

#### Mineral Resources

Known mineral resources in the pertinent counties are petroleum, natural gas, coal, sand and gravel, clays, peat, and sulfur. Sand, gravel, and clay would be used in the proposed project construction.

The area around Lake Darling is a wildlife refuge that has existing mineral development restrictions. Because of those conditions, we anticipate no significant additional conflict with mineral resources.

#### Draft Feature (EIS) Velva Flood Control Project

#### Fish and Wildlife Resources

Paragraph 5.13 - Whooping cranes were not listed because their normal migration path lies west of the basin. However, two whooping cranes were sighted in 1982 on J. Clark Salyer Refuge. Therefore, this species may occasionally migrate through the Velva area.

Paragraph 6.06 - In the last sentence, change "eastern" to "western."

#### Corps Responses to the U.S. Department of the Interior

1. The whooping crane has been added to the list of endangered species in paragraph 5.13. Paragraph 6.05 has been revised to address project effects on this species.
2. We have incorporated this change in paragraph 6.09 of this EIS.

Page 34 - The fourth paragraph discusses impediments to fish movement due to current velocities through the culverts. We anticipate that downstream fish movements could occur whenever the culverts are open. Elevations of the culverts should be set sufficiently low to permit fish movement under low to no-flow conditions.

Page 46, Measures to Minimize Impact - The rock weir to be constructed in the high-flow channel should be sited downstream of the oxbow wetland, and close to the lower junction with the Velva Park loop. Properly designed and located, this weir would create a wetland in the high-flow channel, in addition to maintaining wetland values of the 5-acre remainder of the oxbow.

Page 49 - Corps Response to FWS Recommendation No. 5 - In the last sentence, it states that in order to plant more than 9 acres, additional land would have to be purchased. Additional land may become available at project sites other than Velva. We recommend that if there are any additional project lands, they be evaluated for suitability of establishing woody plantings to complete the balance of the recommended acreage.

#### Summary Comments

We concur with the content of the EIS and the 404(b)(1) evaluation. Coordination with the Fish and Wildlife Service should be continued during implementation of the Velva project to increase the amount of woody revegetation, wetland development and fish passage improvement.

#### Historical Resources

##### Draft Feature Environmental Impact Statement Comments

We are concerned that there is no apparent commitment to replace the rodeo arena. On page 1 a comment is made about "adequate rodeo facilities" being constructed at a nearby site to replace the present facility, but we found no evidence to suggest that an agreement has been reached with the city for such a replacement, or that adequate funding is available to undertake it. This is especially important in view of the statement on page 13 that the arena would probably be relocated at local expense. The final statement should include further discussion of replacement plans for the rodeo arena, including the concurrence of the city of Velva in any plan calling for local financing of its replacement.

It appears that there will be some conversion of land use at the Velva Natural Area. The Velva Natural Area has received matching assistance from the Land and Water Conservation Fund (LWCF), making it subject to the provisions of Section 6(f) of the LWCF Act, as amended. This section of the Act requires that changes from outdoor recreation use be approved by the Secretary of the Interior, and requires the substitution of other properties of at least equal fair market value and reasonably equivalent usefulness and location for the recreation lands to be taken. This would include any encroachment within the existing park boundaries by the project. Any request for a change in land use at this site must be made through the North Dakota State Liaison Officer, who is responsible for administering the LWCF in North Dakota. He is Dr. Douglas Eiken, Director, North Dakota Department of Parks and Recreation, Pinehurst Office Park, 1424 West Century Avenue, P.O. Box 700, Bismarck, North Dakota 58102.

#### Corps Responses to the U.S. Department of the Interior (cont.)

3. Downstream fish movement would be possible through the culverts under low- to moderate-flow conditions or over the rock weir during high-flow periods. The culverts at Velva Park are already set at the lowest possible elevation.
4. As designed, the rock weir would be as far downstream in the cutoff channel as possible. The cutoff channel was specifically designed so that it would maintain water in both the cutoff channel and the adjacent oxbow wetland.
5. We Concur. Paragraph 4.30 and the Corps response to FWS recommendation 5 (see exhibit 3, pages 3-1 and 3-2) have been revised to state that additional land at other project sites that are of similar value to area wildlife will be evaluated for replacement of net vegetation losses in conjunction with project design for erosion control and beautification.
6. We will continue coordination with the Fish and Wildlife Service throughout project implementation (see paragraph 7.05.a.).
7. The city of Velva plans to relocate the rodeo arena. Since these facilities are not extensive, costs associated with the relocation would be very minimal (especially compared to the local share of the total project costs). Paragraphs 1.04 and 6.11 have been clarified to show that there is a commitment for replacement of the rodeo facilities.
8. As a result of this comment and a similar comment from the North Dakota Parks and Recreation Department, the Corps of Engineers met on 7 February 1983 with the North Dakota Parks and Recreation Department, the city of Velva, and the Velva Park Board. This meeting determined that a conversion of land use would result from the proposed action and that specific steps were necessary to bring the project into compliance with the Land and Water Conservation Fund Act. Discussions of the conversion of land use and the process required to bring the project into compliance with the act are in paragraphs 4.31, 5.10, 6.11-6.12, and 7.05.d. of this EIS.



HD-A138 295

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT LAKE  
DARLING FLOOD CONT. (U) CORPS OF ENGINEERS ST PAUL MN  
ST PAUL DISTRICT NOV 83

3/3

UNCLASSIFIED

F/G 13/2

NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

4

We appreciate the opportunity to provide comments and recommendations on the Draft Environmental Statement.

Sincerely,

A handwritten signature in dark ink, appearing to read "Robert F. Stewart". The signature is written in a cursive style with a large, prominent "R" and "S".

Robert F. Stewart  
Regional Environmental Officer



DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the  
Principal Regional Official

Region VIII  
Federal Office Building  
1981 Stout Street  
Denver CO 80204  
ROFEC

December 6, 1982

Colonel Edward G. Rapp  
District Engineer  
St. Paul District Corps of Engineers  
1135 U. S. Post Office and Custom House  
St. Paul, Minnesota 55101

Dear Colonel Rapp:

We have reviewed the first two portions of the environmental documentation for the Lake Darling and Velva Flood Control Project in North Dakota.

The DEIS states that public facilities and services, as well as other environmental factors, would not be significantly impacted by this proposed flood control project. We agree with this conclusion with respect to availability of existing social services in the affected area.

It is suggested, however, that the North Dakota Department of Human Services be added to the list of State agencies from which comments are solicited.

Sincerely yours,

*James D. McIntire*  
James D. McIntire  
Director, ROFEC

Corps Responses to the U.S. Department of Health and Human Services

1. The North Dakota State Intergovernmental Clearing House sent the Lake Darling draft programmatic EIS and the draft Velva site-specific EIS to the North Dakota Department of Human Services. We received no comments from the Department of Human Services. This agency has been added to the mailing list for the final EIS.

U.S. Department of Housing and Urban Development  
Denver Regional Area Office  
Executive Tower Building  
1405 Curtis Street  
Denver, Colorado 80202

November 24, 1982

Colonel Edward G. Rapp  
District Engineer, Department of the Army  
St. Paul District Corps of Engineers  
1135 U. S. Post Office and Custom House  
St. Paul, MN 55101

Dear Colonel Rapp:

Thank you for the opportunity to review and comment on the Draft Feature Environmental Impact Statement (EIS), Velva Flood Control, a Part of Lake Darling Flood Control Project, McHenry County, North Dakota.

Your EIS has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development. This review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas.

It would appear that the construction jobs generated by this project could have an impact on the housing needs of the community. The availability and adequacy of housing for this workforce should be addressed. Otherwise, we find this document adequate for our purposes.

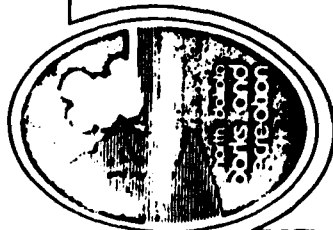
If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer, at FTS 327-3102.

Sincerely,

*Robert J. Matuschek*  
Robert J. Matuschek  
Director  
Office of Regional Community  
Planning and Development, 8C

Corps Response to U.S. Department of Housing and Urban Development

1. A worst-case analysis of housing needs for the Lake Darling project (including Velva and all other improvements) found that there should be no negative impacts on local housing. The analysis assumed that all workers were new to the region (not already living in the Minot area), and that the new workers would primarily reside in Minot and commute to the various work sites. Those years requiring the greatest number of employees would thereby require housing for 210 new workers (possibly with families) on the average, with 310 as the maximum number of new workers at any time during these years. Minot had adequate unused residential capacity, as of November 1982: 246 residences for sale, 57 rental units vacant, and 63 mobile home units available.



## NORTH DAKOTA PARKS AND RECREATION DEPARTMENT

Pinehurst Office Park  
1224 West Century Avenue  
P.O. Box 700  
Bismarck, ND 58502  
Phone: (701) 224-4887

December 13, 1982

Edward G. Rapp  
Colonel, Corps of Engineers  
District Engineer  
Department of the Army  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, Minnesota 55101

Dear Mr. Rapp:

In response to my review of the environmental documentation for the Lake Darling Flood Control Project, please be informed that the proposed construction of a levee and cutoff channel may conflict with park and recreation projects funded through the Land and Water Conservation Fund Program. The proposed action could result in relocation of the rodeo grounds and nature trail, requiring a conversion of land use as outlined in Section 6f of the Land and Water Conservation Fund Act.

These comments are submitted for inclusion in the final impact statements. Please contact this office for any additional information you may need.

Sincerely,

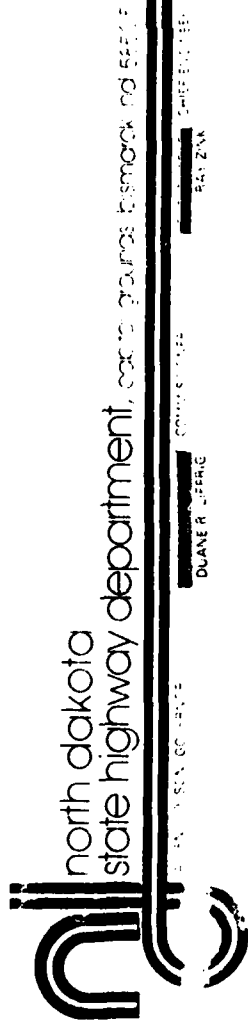
*Karen Bauml*

Karen Bauml, Coordinator  
Grants and Community Services

KB/cb

Corps Responses to the North Dakota Parks and Recreation Department

1. On 7 February 1983, the North Dakota Parks and Recreation Department, the city of Vella, the Vella Park Board, and the Corps met to determine the effect of the project on Land and Water Conservation Fund lands. This meeting determined that a conversion of land use would result from the proposed project and that specific steps were necessary to bring the project into compliance with the Land and Water Conservation Fund Act. Discussions of the conversion of land use and the process required to bring the project into compliance with the act are in paragraphs 4.25, 6.10, 6.11-12, and 7.05.d. of this EIS.



DUANE R. JENSEN  
CHIEF ENGINEER  
RAUL ZINK  
CHIEF ENGINEER

Corps Responses to the North Dakota State Highway Department  
1. Comment noted.

December 6, 1982

Colonel Edward G. Raap  
.... Corps of Engineers  
Department of the Army  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

LAKE DARLING EIS - MCSPD-ER

This is in response to your letter of October 29, 1982, soliciting comments on the above referenced project. Our main concerns in general are the temporary and/or permanent disruption to the transportation system both during and after construction. Specifically, our comments about the four affected state and county crossings are the same as outlined in a letter dated March 17, 1982, from Stanley Haas to Mr. Dave Loss of your office. Further comments may be offered at a later time after the reservoir operating plan is better defined.

It is our understanding that all state and county roads affected by the raising of Lake Darling Dam would be considered as part of the Corps of Engineers project cost.

In regard to the Velva Flood Control proposal, it does not appear that any state or county roads would be impacted by this project.

Thank you for the opportunity to comment on this proposal. Please keep us informed of the progress and future plans as they are developed.

*Charles A. Gullicks*

Charles A. Gullicks, P.E.  
Program and Project Development Engineer

jmp

# NORTH DAKOTA GAME & FISH DEPARTMENT

"Variety in Hunting and Fishing"

2121 Emmett Avenue  
Bismarck, North Dakota 58105  
Phone: (701) 224-2140

January 24, 1983

Colonel Edward G. Rapp, District Engineer  
U.S. Army Corps of Engineers  
1135 U.S. Post Office & Custom House  
St. Paul, MN 55101

Re: Draft Programmatic Environmental  
Impact Statement - Lake Darling  
and Velva Flood Control Projects

Dear Colonel Rapp:

We have reviewed the above referenced draft statements and have consulted with the U.S. Fish and Wildlife Service on mutual wildlife concerns.

The North Dakota Game and Fish Department has no objections to the Velva project as proposed. We believe this tier of the programmatic EIS adequately addresses the major wildlife concerns relative to the Lake Darling - Souris River, as well. We support a rapid drawdown as the preferred alternative for in stream flows.

Thank you for the opportunity to comment.

Sincerely,

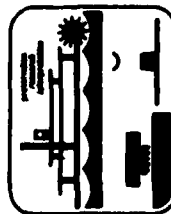
  
Dale L. Henegar  
Commissioner

KS:DLH:lr  
cc: USFW - Bismarck (Attn: Vic Hall)

Dale L. Henegar  
COMMISSIONER

Charles H. Schroeder  
DEPUTY COMMISSIONER





State Historical Society  
of North Dakota (State Historical Board)  
North Dakota Heritage Center, Bismarck, N.D. 58505  
Telephone 701-224-2666

January 13, 1983

Col. Edward G. Rapp  
District Engineer  
St. Paul District, Corps of Engineers  
1135 U.S. Post Office and Custom House  
St. Paul, MN 55101

Re: Draft Programmatic EIS, Lake Darling Flood Control Project and  
Draft Feature EIS, Velva Flood Control Project. (SHPD File:  
82-11(8)2.3)

Dear Colonel Rapp:

Thank you for sending a copy of the documents referenced above to this office for review and comment.

Draft Programmatic EIS, Lake Darling

In essence, we agree that the level of cultural resource investigation conducted to date in the project area is commensurate with the current project planning phase. We are agreed that cultural resources do exist in the project area and that several significant and/or potentially significant cultural resources will be adversely affected by the project.

We are pleased to know that additional identification and evaluation studies will be completed as the planning process continues. We look forward to being apprised of the results of these studies and to completing the consultation processes.

Draft Feature EIS, Velva

Although the statement to date appears encouraging, this office can neither agree nor disagree with the stated assumptions concerning identification, evaluation or potential impacts to cultural resources pending receipt, review and evaluation of the Velva Flood Control Cultural Resources survey report.

Corps Response to the State Historical Society of North Dakota

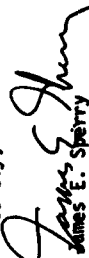
1. As paragraph 7.05.c. states, we will coordinate the cultural resources survey report with the National Park Service and the State Historic Preservation Officer during spring 1983. All comments generated from this review and the implications for the Velva features will be discussed in a supplemental information report to be filed with EPA before construction begins.

Colonel Rapp  
Page 2  
January 13, 1983

Again, however, we are pleased to know that this cultural resource identification and evaluation effort is in progress and that the results will be considered in subsequent planning phases.

If you have questions about these comments, please contact Mr. Walter L. Bailey (701-224-2672) at your convenience.

Sincerely,

  
James E. Sherry  
State Historic Preservation Officer  
(North Dakota)

VLB/je

FILM

4-8